THE physical therapy REVIEW

35th Annual Conference
American Physical Therapy Association
Olympic Hotel Seattle, Washington
June 15-20, 1958

Physiological Basis of Volitional Movements — FISCHER

Five Year Study of Treatment of Bromidrosis and Epidermophytosis with Copper Iontophoresis — KINNARD and RIEMER

Problems of Rehabilitation in a General Hospital — ECHTERNACH

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Conference Issue

Volume 38, Number 6 **June 1958**

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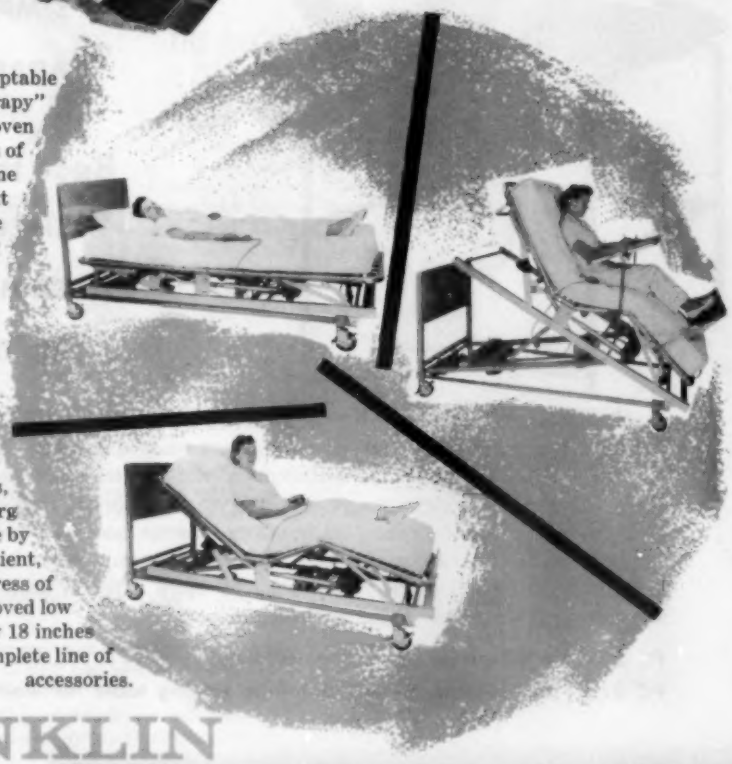

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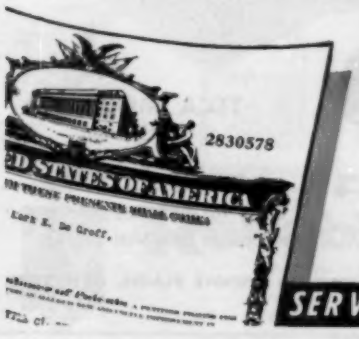

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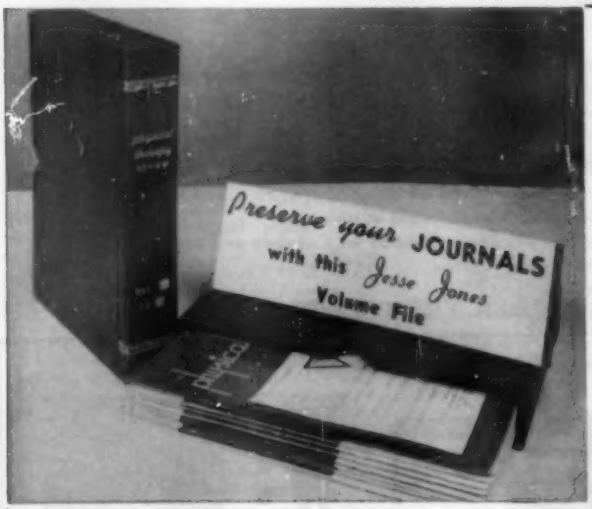

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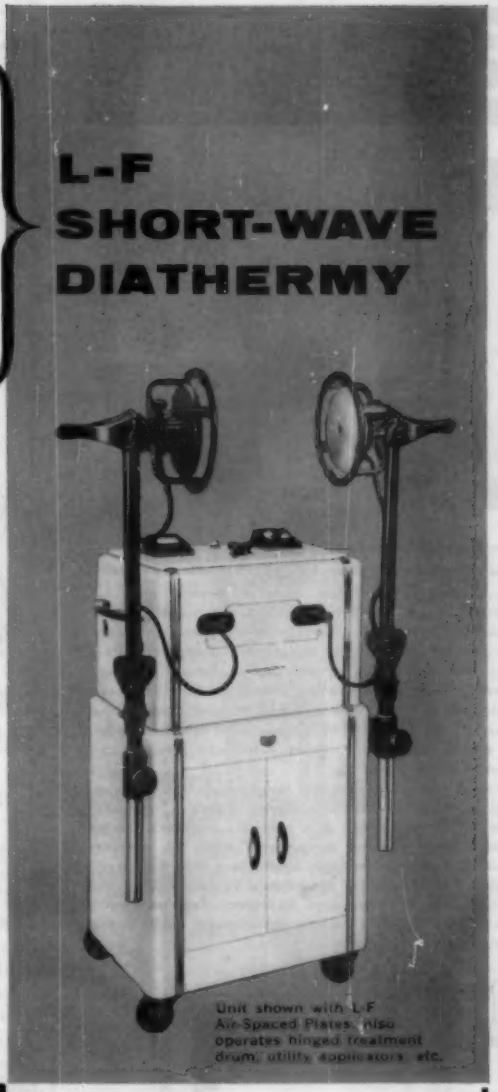
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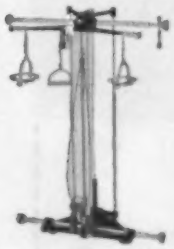

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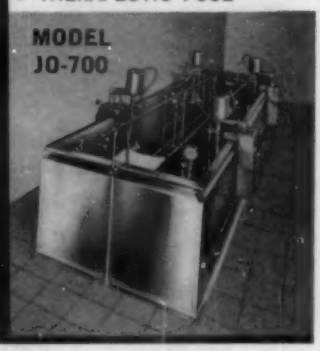

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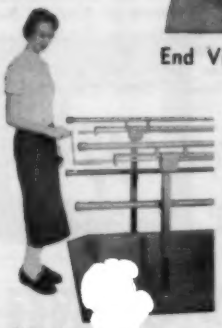

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Participation of Staffs of Different Agencies in Data Collection—A Report on Method. Marion Ferguson and Jeannette E. Westlake, Nurs. Res., 7: 23-26, February 1958

ANATOMY

The Prenatal Development of the Skeleton and Joints of the Human Hand. D. J. Gray, Ernest Gardner and Ronan O'Rahilly, Am. J. Anat., 101: 169-222, September 1957

The Winged Scapula. Donald J. O'Brien, South. M. J. 51: 191-199, February 1958

CIRCULATION

A Modified Nylin Cardiorespiratory Test Employing a Three-Step Portable Staircase. C. Maurea, G. Nylin and A. Sallberger, Am. Heart J., 55: 277-287, February 1958

Influence of an Oscillating Bed on Cutaneous Temperature and Oxygen Tension of Ischemic Toes. Carlos Forno, H. Montgomery and O. Horwitz, Circulation, N. Y., 17: 277-283, February 1958

Medical Management of Peripheral Vascular Disease. Arnold Iglauer, Angiology, 9: 11-14, February 1958

The Distensibility of the Blood Vessels of the Human Calf Determined by Graded Venous Congestion. B. S. L. Kidd and S. M. Lyons, J. Physiol., Lond., 140: 122-128, Jan. 23, 1958

The Status of Cardiac Surgery. Gerald H. Pratt, J. Am. Geriat. Soc., 6: 71-80, February 1958

Vertigo and Dizzyness. Dwight Palmer, Ohio State M. J., 54: 183-186, February 1958

ELECTRODIAGNOSIS

Electromyography. A Tool in Ocular and Neurologic Diagnosis-Part III. G. M. Breinin, A.M.A. Arch. Ophth., 59: 177-187, February 1958

NEUROLOGY

Arteriovenous Anomalies of the Brain. Frank M. Anderson and Marvin A. Korbin, Neurology, 8: 89-101, February 1958

Neurology: Past, Present and Future. Russell Brain, Brit. M. J., 5067: 355-360, Feb. 15, 1958

Sensory Disturbances in Children with Infantile Hemiplegia, Triplegia and Quadriplegia. L. B. Homan, L. Baker and R. Reed, Am. J. Phys. M., 37: 1-6, February 1958

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Caudate Lesions and Spontaneous Locomotion in Monkey. George D. Davis, Neurology, 8: 135-139, February 1958

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Self Stimulation of the Brain. J. Olds, Science, 127: 315-324, Feb. 14, 1958

The Galvanic Skin Reflex. A Review of Old and Recent Works from a Physiologic Point of View. Ging Hsi Wang, Am. J. Phys. M., 37: 35-57, February 1958

The Neck-Righting Reflex in Children. R. L. Spitzer, Y. Kramer and R. Rabkin, J. Pediat., 52: 149-151, February 1958

ORTHOPEDICS

Care of the Infant with Congenital Subluxation of the Hip. Paul C. Colonna, J. Am. M. Ass., 166: 715-720, Feb. 15, 1958

Do's and Don't's in the Treatment of Hand Injuries B. C. Kilbourne and E. G. Paul, Surg. Clin. N. America, 139-154, February 1958

Fractures and Dislocations of the Hands and Fingers. Malvin J. Nydahl, Minnesota M., 40: 849-852, December 1957

Osteoarthritis of the Hip. K. Little, L. H. Pimm and J. Trueta, J. Bone Surg. Brit. Vol. 40-B: 123-131, February 1958

Physical Treatment Employed in the Rehabilitation of a Patient with Morquio's Disease. Roy T. McReynolds and O. Leonard Huddleston, Arch. Phys. M., 39: 87-91, February 1958

Steroid Therapy—Revision Series (concluded). J. H. Glyn and D. R. L. Newton, Ann. Phys. M., Lond., 4: 176-192, February 1958

Untoward Effects Following Local Hydrocortisone Injection. P. Hume Kendall, Ann. Phys. M., Lond., 4: 170-175, February 1958

PHYSICAL MEDICINE

A Doctor in the Department. R. W. Barter, Ann. Phys. M., Lond., 4: 161-169, February 1958

PHYSIOLOGY

Effects of Immobilization Atrophy in the Histochemical Characterization of Skeletal Muscle. L. Eichelberger, M. Roma and P. V. Moulder, J. Appl. Physiol., 12: 41-50, January 1958

The Physical Work Capacity of Workers 50-64 Years Old. Irma Astrand, Acta physiol. scand., 42: 73-86, 1958

POLIOMYELITIS

Efficacy of Poliomyelitis Vaccine. L. Shuman, H. Kleinman, L. Krovetz and D. Fleming, J. Am. M. Ass., 166: 1027-1035, March 1, 1958

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Shearing Force as a Factor in Decubitus Ulcers in Paraplegia. Samuel M. Reichel, J. Am. M. Ass., 166: 762-763, Feb. 15, 1958

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The Role of the Physiotherapist in Psychological Medicine. N. G. Harris, Physiotherapy, 12: 39-41, February 1958

PULMONARY DISEASE

Recent Developments in the Treatment of Tuberculosis in Man. J. W. Raleigh and J. D. Steele, J. Am. M. Ass., 166: 921-925, Feb. 22, 1958

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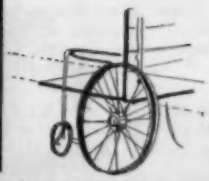

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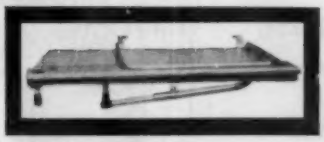

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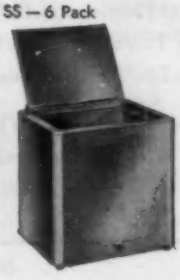

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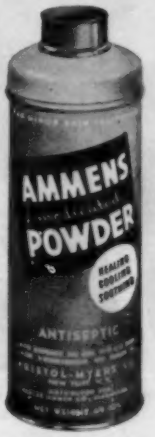

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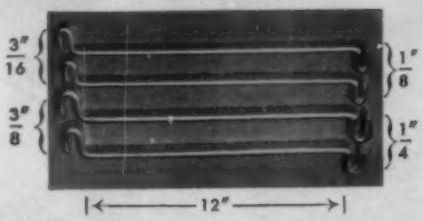

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The Physical Therapy Review

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*Physiological Basis of Volitional Movements**

Ernst Fischer, M.D.

This topic is one of the most difficult and one of the most controversial in physiology. Whatever facts a physiologist selects from the vast clinical and experimental data, dealing with one or the other of the many physiological processes participating in what we loosely call volitional movements, to build up a comprehensive theory which can be visualized by students to a certain extent, he will become an easy target for smashing critical attacks by his fellow physiologists. Too many details are known, often so contradictory that any attempt to reconcile them with one another has failed. The seriousness of the situation is best attested by the fact that the better textbooks of physiology for advanced students never have a chapter on volitional movements and often do not mention them at all. At best, they spend a few words on "integral function of the central nervous system in locomotion" after having filled pages and pages with numerous details about partial functions attributed to various parts of the central nervous system (CNS) as concluded from clinical observations or from experiments in which certain parts of the CNS were destroyed.

The writers of textbooks for beginners in physiology are not so hesitant to set forth simple theories of volitional movements. But of these theories, one can only say that they are, without doubt, wrong, that the authors do not really believe in them, and that they are the cause of many misconceptions concerning the mechanism of volitional movements.

If we ask why the *interpretation of clinical and experimental studies* of volitional movement is so extremely difficult, the answer has to deal with many facets of the problem. The first hurdle is, what is the meaning of "volitional." This hurdle we can avoid for the moment by speaking of "purposive" movements. There still remains the question: are clinical observations made on humans really comparable to experimental studies on animals, since it is well known that what seem to be comparable lesions in different species from an anatomical point of view cause quite different alterations in purposive movements? We know, furthermore, that any experimental lesion (and probably also many of the lesions spontaneously developing in patients) besides destroying nerve cells and pathways at the site of the lesions, thus abolishing function of a discrete part of the CNS, produces also "shock" of other parts of the CNS. Shock of the CNS designates a temporary absence of function in any part of the CNS with unaltered morphological structure. Best known to you is the long lasting shock of the spinal cord after its complete severance from the higher parts of the CNS. There is a general rule that the more rostral in the CNS a lesion is set the less general shock is produced, and the duration of the shock is much shorter than for lesions more caudal.

It is recognized that many, if not all, lesions restricted to small parts of the brain produce shock in other parts, often remote from the lesion. This more local shock phenomenon is often referred to as "diaschisis."

Although we can describe the occurrent shock

Research Professor of Physiology, Medical College of Virginia, Richmond.

* Reproduced upon request from the Manual (APTA-OVR Institute, April 1956), which is no longer available. Dr. H. J. Ralston's paper, Some Considerations of the Physiological Basis of Therapeutic Exercise, and Dr. Fischer's Physiological Basis of Methods to Elicit, Reinforce, and Coordinate Muscular Movements will appear in the July issue of the *Physical Therapy Review*.

phenomena very well, the interpretation is difficult. If a lesion at the site "a" produced permanent abolishment of the function "A" and temporary abolishment of the function "B", while later a second lesion at the site "b" causes permanent disappearance of the function "B", is this sequence really explained by diaschisis at the site "b", or did site "b" slowly take over one of the functions of site "a" after its destruction. Without going into further details, I shall only point out that in recent years more and more neurologists and neurophysiologists realize that no part of the CNS has, during normal life, an isolated function as can be produced so often by experimentally separating that part more or less from the influence of other parts of the CNS. No single part of the CNS will function normally when deprived of its dynamic relations to other neural structures and their functions.[1]

Before trying to develop these ideas for the problem of volitional movements, I have to destroy a few misconceptions some of you may have, either due to the oversimplified presentations by some authors or due to important changes in conceptions brought about by more recent research.

Since Fritsch and Hitzig reported nearly 100 years ago that *electrical stimulation of the precentral gyrus of the cerebrum* causes movements in the limbs of the opposite body side, the so-called "motor cortex" played a central part in any theory of volitional movements. It is not the experimental facts as described in the form of maps of the motor cortex, so well known to you, that are under attack, but their interpretation and their meaning for the problem of volitional movements. Most authors will agree today with Walshe[2] that any "mosaic" theory of cortical functions as the basis of volitional movement is out of question. In its extreme formulation, the mosaic theory claims that specific cells in the cortex activate a specific muscle, if not even a specific motor unit in that muscle, so that the complicated agonistic, synergistic and antagonistic muscle coordination during volitional limb movement reflects only the mosaic formed by active and inactive cells in the motor cortex. However, nobody was able to produce by electrical cortex stimulation either in man or monkey any movement resembling a true volitional effort, such as grasping an object with the hand. What one really sees are joint movements or movements which at best are comparable to complicated reflex movements as can be elicited from a purely spinal preparation. We now know that with near threshold stimulation, which we have to use to avoid "mass movements," we do not stimulate only one or a few Betz's cells directly under the electrode, but several Betz's cells out of many distributed in a relatively large area (2-3 mm. in diameter), namely only those Betz's cells in this area which have just at the moment the lowest threshold.[3] This immediately raises the question, is the excitation pattern which is brought about by electrical stimulation the same as under "volitional effort." During volitional effort the motor area receives many impulses from other parts of the CNS. In other words, is an electrical stimulus an adequate stimulus for "purposive" movement? It has been further demonstrated that the Betz's cells continuously fluctuate in their threshold,[4] and that with repeated electrical stimulation other cells become activated although apparently the same movement results.

Whatever the role of the motor cortex in purposive movements, this role cannot be described as an absolute control even when electrically stimulated. It is recognized now that movements resulting from stimulation of a circumscribed spot of the motor cortex depend considerably on the posture of the limb to be moved at the moment of stimulation.[5] As in reflex activity restricted to the spinal cord, where we cannot say which part of the total reflex arc is more important in governing the reflex movement, the central synapses or the peripheral receptors, the normal function of the motor cortex cannot be isolated from the occurrences in the periphery.

Our conceptions about the *pyramidal* and *extrapyramidal motor systems* have also changed during the last decades. Since the pyramidal tracts are formed by the axon cylinders of the Betz's cells, it was believed that they represent a direct connection between the cortex and the anterior horn cells in the spinal cord and were solely involved in volitional movements. On the other hand, the task ascribed to the extrapyramidal motor system was that of regulation of posture and tonus, since postural and tonic disturbances are so often seen in patients with lesions somewhere in the extrapyramidal system.

Some of the main clinical reasons why more and more neurologists recognize *the pyramidal system together with the extrapyramidal system* as *one physiological unit* involved in purposive movements, are the observations that symptoms produced by a distinct lesion in one of the anatomical systems can often be abolished or diminished by certain lesions in the other anatomical system. Thus "spontaneous grasping," often a typical sequence to extrapyramidal lesions

might disappear after damage to area 4 of the motor cortex.[6] Similarly, the often successful operation of weakening the pyramidal system by ablation of the upper layers of the motor cortex, which diminishes or abolishes typical symptoms of extrapyramidal lesions such as tremor in Parkinson's disease[7] or choreo-athetosis,[8] favors the idea that the balance between the functional state of these two systems is more important for "normal" purposive movements than the complete functional integrity of either system.

Supporting evidence for such a new conception of functional unity of both systems and against a "mosaic" theory of motor cortex function has been supplied by neuroanatomists and neurophysiologists who could demonstrate that only a very small minority of the *pyramidal fibers* of the spinal cord form terminal knobs on anterior horn cells, but that the majority of the pyramidal fibers form their terminal knobs on nerve cells of the internuncial pool,[9] which receives also the major part, if not all, of the terminal knobs of the extrapyramidal systems. It has been known for a long time that the pyramidal tracts in the spinal cord contain more fibers than there are Betz's cells in the cortex. Studies of the electrical activities of the pyramidal axons revealed that they branch in their course down the spinal cord, and that a single synchronous volley set up by a single electrical stimulus in the region of the medulla will reach the spinal cord spatially and temporally dispersed, and that the electrical activity recorded at the spinal cord is modified by the spinal reflexes set up with the onset of movement.[10]

During the last decades investigation has further shown that, contrary to the older conception, the highest center for integration of the *extrapyramidal system* is not in the basal ganglia but in the motor and premotor cortex. We know today that there are many projections from the motor and especially the premotor cortex to the basal ganglia and also many back-projections from the basal ganglia to the motor cortex.[11]

As you may recall, I tried earlier to simplify our problem by suddenly shifting from "volitional" movements to "purposive" movements; however, we have to face the problem of "volition." "Sleepwalking" of man or the running of a completely decorticated dog are without doubt "purposive" movements, but we cannot call them volitional movements, since a volitional act must be a "conscious" act. We know from experience with reeducation of motor skill that in the beginning, a certain movement can be brought about only by extreme "volitional" effort with a very high "awareness" of the effort. However, with progress of reeducation, effort, and especially awareness of the effort, diminishes. Such experiences and others lead to the conception that there might exist various levels of "consciousness," as is now generally recognized by some psychologists. It is obvious that the movement by itself does not permit us to decide whether we deal with a "purposive" or a true "volitional" movement. Only our own inner experience can tell us how much "volitional effort" went into the initiation of the movement. The fact that someone is conscious of the occurrence of a movement of his body does not say anything about the volitional origin of the movement. One can be well aware of the knee jerk reflex. We can say, at least from a theoretical point of view, that in the case of a reflex the awareness is later than the onset of the movement, whereas in a "volitional" movement the act of the awareness of the effort must occur not later than the onset of the movement. But in practice, it is nearly impossible to discriminate between "volitional effort" and awareness of the movement. If we consider movements of animals, we cannot speak of volitional movements at all, since at best we can only make crude guesses about their level of consciousness. The same is true for movements of patients with obvious disturbances of consciousness. Therefore, it is much more fruitful to speak of various levels of "motor behavior," such as "acquired or learned movement," "natural purposive" movements, and so on. Learned movements, as you know, are possible only when the motor cortex is completely or at least partially intact. Any further destruction of parts of the CNS will lower the level of motor behavior until, if only the spinal cord is left, motor behavior will be restricted to spinal reflexes which are still complicated, well organized, and coordinated movements. Think, as an example, of the "scratch reflex" of the spinal dog, where the hind foot without fail will reach the exact spot on the skin at which the stimulus was applied. If we continue to destroy more and more parts of the spinal cord until only one of its segments is left intact, the reflexes become simpler and simpler, but still the coordination mechanism between agonists and antagonists by reciprocal innervation and the influence of proprioceptor and exteroceptor stimulation are still present. It is true that the one-segmental reflex might be quite different than the reflex produced by the same eliciting stimulus under

normal conditions. But we understand this, when we recall the fact that the afferent nerves as well as the efferent nerves for one limb, and even for one muscle, do not enter or leave the spinal cord by the roots of one segment, but enter or leave by all the roots of a part of the spinal cord several segments long.

To explain the various levels of "motor behavior" including its highest level in man, "volitional movement," a new concept of the organization of the CNS has been developed over the last decades. This new concept is often called the "transactional viewpoint."[12] The general organization of all parts of the spinal cord is the same from the spinal cord, through medulla, midbrain, diencephalon to the cerebral cortex, and is the same also for the bypasses through the cerebellum. This organization of each part consists basically of the same three functional components: sensory or perceptory, motor, and the "neuropil" (internuncial pool) with its polysynaptic diffusion. In each part of the CNS arriving perceptory impulses activate, through the neuropil according to the pattern of reception, the pattern of motor activity. The higher parts of the CNS modify the actions brought about by the lower parts. It might be pointed out here that even Penfield, a neurosurgeon who studied the primary and secondary motor areas in man, in his newer publications accepts the "transactional viewpoint" to a certain extent and states that the motor area of the cortex in man is only indispensable for the most dexterous voluntary movements of fingers and toes.[13]

In the scheme of the transactional view I have added to the three original components of organization (sensory, motor, neuropil) as given originally by Coghill,[14] a fourth component, the gamma efferent system discussed by Dr. Ralston. The discharges of this system, which governs the sensitivity of the muscle proprioceptors, can be influenced in practically all parts of the CNS by incoming perceptory impulses.

The transactional viewpoint does not exclude the precept that one part of the CNS, depending partly on what perceptory impulses reach the part in question, might have an antagonistic effect upon a certain function when compared to the effect of another part of the CNS on this function. The function will be determined by the balance between the influences exerted by the two parts. The best example is probably decerebrate rigidity. It is well known that in most animal species maximal rigidity occurs by a cut separating the front part from the hind part of the CNS at the level of the red nucleus. The release of the hind part of the CNS from the inhibitory influence from S4 of the cortex, from various parts of the basal ganglia, and from the rostral parts of the midbrain, permits the excitatory influence from the caudal part of the midbrain, from the vestibular nucleus, and from parts of the cerebellum to raise the proprioceptor reflex sensitivity to maximal level. This is accomplished not only by lowering the threshold of spinal synapses, but probably also through the gamma efferents by lowering the threshold of the peripheral proprioceptors. It is well recognized that under most conditions of decerebrate rigidity, either cutting both vestibular nerves or complete deafferentation of the limbs abolishes the rigidity, thus proving that indeed we deal in decerebrate rigidity with an increased sensitivity of the normal proprioceptor reflex mechanism.

Those who first advocated transactional viewpoint developed this idea from two different types of studies and considerations. It was observed that the older ontogenetically a mammalian species is, the more primitive is its motor behavior and the less variability of its behavior will be shown. Ontogenetically, we see a development from the simple fish movements through amphibian and turtle-like movements to the mammalian type of movement, which finally reaches the greatest complexity and highest variability in the primates. The CNS of these species shows correspondingly that more and more parts are added rostrally to the spinal cord.[14] On the other hand, it was observed, in accordance with a general biological rule, that in the *embryological development of the CNS* the ontogenetic development is repeated, at least partly, and that with advancing stages of embryonic development the later ontogenetic types of motor behavior can be elicited.[15,16] Each type of motor behavior which can be elicited at a given stage corresponds more or less to the development and maturity the neural structures have reached at that stage. When comparing the type of motor behavior elicited with the stage of development of the CNS, neuroanatomical studies are necessary, since it is well known that maturation of the CNS and general development do not run parallel. At the time of birth, maturation of the CNS is much more advanced in some mammalian species than in others.[17] Thus the newborn bear has an effective locomotion, while the newborn primate shows only a very primitive motor behavior. But in both newborns, the motor behavior corresponds to the development and maturation of their CNS.

The arriving impulses from proprioceptors and from skin exteroceptors at various levels of "transaction" in the CNS is of utmost importance for the resulting pattern of motor activity. For this reason, many authors speak of a "sensomotility." Although only in recent years more and more attention was paid to the importance of these afferent impulses in determining the pattern of motion, the importance of faulty perception on the pathology of coordination was pointed out by O. Foerster more than 50 years ago.[18] Since that time, the effects of deafferentation on locomotion [19] and on single limb movements has been studied in detail in amphibians.[20] Those studies established clearly that rhythmic locomotor movements are not due to an inherent CNS control, but are the result of afferent impulses arriving at the CNS and elicited by the first movement. Interaction by stimulation of pain fibers, even if true pain sensation cannot be produced, modifies motion at many levels of the CNS.[21] In recent years many new pathways have been discovered for the projection of cutaneous and muscular afferents to the sensory and motor cortex.[22] Many clinical observations.[6,23] as well as experimental studies on the monkey [24] with cortically induced movements revealed a decisive influence of the arriving afferent impulses.

Thus we find a complicated self regulation of motor activity at each level of transaction but with the highest regulatory capacity and with the highest variability at the motor cortex where besides the cutaneous and muscular feed-backs, visual sensation exerts a considerable control.[25] Of special importance also are the sensorimotor transactions at the level of the red nucleus, midbrain and cerebellum, since at these levels the afferent impulses coming from the labyrinth exert their influence upon motor and posture. Models of mechanisms demonstrating self-regulatory influence upon motion by feed-backs from the periphery have been devised.[26] Even the most cleverly constructed models, however, demonstrate only what regulatory mechanisms can achieve, but do not tell us anything about the true mechanism utilized for this purpose in the CNS.

At the lowest level of transaction, at the *spinal cord*, the *influence of the afferent impulses* on the reflex activity has been generally recognized for a long time.[27] Not only the site of skin stimulation and the pattern of stimulation determine to a large extent the type of reflex movement elicited, but also the proprioceptor impulses arriving at the cord at the time of stimulation may have a deciding influence. The best example is Magnus' experiment with stimulation of the tip of the tail of a spinal cat. When the cat lies on her left side and the tail hangs down vertically over the edge of the table, stimulation will cause a reflex movement of the tail to the right, when lying on her right side, but otherwise in the corresponding position, the reflex movement of the tail will be to the left. Apparently, the anterior horn cells most highly bombarded by proprioceptor impulses due to stretch of their muscles are those which will be activated by the incoming reflex stimulation. Similar relations exist for the influence of limb positions upon the reflex movements elicited. Not only proprioceptor impulses from the muscles which act as prime movers or as prime antagonists for the elicited reflex movement can alter the later course of the reflex movement, but also other proprioceptor impulses. Even those coming from muscles far away from the limb involved in the reflex movement can alter the reflex.[30] Such a remote effect is most clearly shown in the so-called "neck reflexes," which will be discussed later in detail. It should be pointed out now, however, that the controlling influences of the neck reflexes do not originate alone from the impulses coming from the proprioceptors of the neck muscles, but also from impulses coming from the receptors of the ligaments and capsules of the joints involved in neck movements.[31] Quite recently, it has been demonstrated that joint sensation coming from a limb at a given position or elicited due to joint movement has a similar influence upon reflex movement as the proprioceptor impulses coming from the muscles bridging the joint in question.[32,33] Even in spinal animals, in which no pain reaction can be produced by stimulation of pain nerve fibers from the hind part, such stimulation will alter reflex activity in the caudal part, mostly in the direction of depressing it.[34]

The studies of Granit [35] of the gamma efferent system have revealed that we have not only a regulatory servomechanism or feed-back from the periphery to the cord (proprioceptor afferents), but also a servomechanism by which the CNS influences the sensitivity of the peripheral muscular proprioception. Reflex activation of the gamma efferents is not only possible throughout the main axis of the transactional system, but also via the neuropil of the bypass formed by the cerebellum.[36] The gamma efferent system apparently has an organization at least as complicated as that of the pyramidal-extrapyramidal efferent system. There is experimental

evidence that two distinctly different pathways coming from the brain stem influence the discharge rate of the gamma ventral horn cells.[37] Granit is inclined to assume that in the initiation of volitional movement, elicitation of a proprioceptor reflex by a sudden increase of the sensitivity of the proprioceptors via the gamma efferents plays an important part.

There is no doubt but that pathways which are existent and functionally mature play an important role in the phenomena observed in sensomotility. However, we realize also that despite a given neuroanatomical structure, the *CNS shows a considerable "plasticity" in function.* How otherwise is learning of new motor skills possible? Although in man learning of new motor function often requires volitional effort in the beginning of learning, this does not permit us to make consciousness an essential condition for motor learning. Even such low animals as an octopus or even an earthworm can acquire new motion or at least new sequences of motions by learning. Can we assume a conscious learning for the octopus or the earthworm?

You are all probably familiar with the work of Pavlov,[39] who consistently avoided using any psychological definition in explaining the acquisition of new functional patterns. His theory of conditional reflexes which are responsible for the new patterns uses only such physiological definitions as extinction by inhibition, reenforcement, and so on. Is learning of new motor skills something comparable to the establishment of conditional reflexes? Konorski [39] has emphasized that in Pavlov's conditional reflexes, the natural stimulus, which is an exteroceptor stimulation, is exchanged for another exteroceptor stimulus. But in motor learning a new or a changed proprioceptor stimulation combines or is added to the conditional stimulus. It is well known that no new movement can be learned by the deafferentated limb, and that the learning capacity for a partially deafferentated limb is restricted.

Whatever the exact mechanism in learning of new motions might be, we have to assume that some synapses become more readily passable for arriving impulses (diminished threshold), yet in other synapses more resistance to a passage of impulses has developed (increased threshold). These changes in threshold are apparently brought about only by repeated use or constant disuse of the synapses in question. That such changes in synaptic thresholds really develop, has been experimentally demonstrated.[40,41]

How to explain that *use or disuse of a synapse facilitates or inhibits later passage of impulses* through the synapse is a problem, to which the physiologists have not yet found a satisfactory answer, supported by experimental proofs. Many speculations have been offered, however. All agree that in the problem of learning, facilitation and inhibition are not the processes described in detail under these names in all textbooks of physiology. What the physiologist means in general by facilitation and inhibition refers to the fact that one impulse arriving at a synapse facilitates or inhibits the passage of another impulse arriving at the same synapse, either simultaneously or very little later than the first impulse. The underlying mechanisms are well known and explain satisfactorily why these facilitory and inhibitory influences are of relatively short durations, usually measured in milliseconds rarely extending into seconds.

But in learning, we deal with a type of facilitation and inhibition which is of extremely long duration. Bayliss [42] assumed for this long-lasting influence upon the synaptic transmission, a more or less permanent change in the surface tension of the nerve cell caused by the first excitation process, and that this change in surface tension alters the degree of contact between the two neurons. Eccles [41] calculated more recently that the metabolism connected with the passage of an impulse through a terminal knob causes the latter to swell, and thus the small distance between knob and nerve cell surface becomes diminished. The smaller the distance, the easier the passage of an impulse. In absence of impulse transmission, due to lack of activity, the terminal knob shrinks slowly, thus increasing the resistance to the passage of impulses. Pomerat [43] had observed that some neuroglial cells (which are most numerous in the higher parts of the CNS), especially the astrocytes, have highly pulsative and amoeboid movements in tissue cultures. He speculates that such movements of the neuroglia also occur in the living CNS. Since the neuroglia plays an important metabolic role for the neuron, it might be possible that in conjunction with the metabolism connected with the passage of an impulse through a synapse, amoeboid movements of astrocytes are elicited which alter the contact between two neurons.

Can we assume new formation of terminal knobs and disappearance of such knobs? We have not the least evidence that terminal knobs disappear in consequence of disuse, all indications are only in favor of diminished functional capacity. Since we know now that the terminal

branches of fine nerve fibers form new sprouts in a partially denervated muscle, the question can be raised, does such a sprouting occur in the CNS leading to new terminal knobs? Most neurophysiologists will deny this possibility, at least for the normal, matured CNS. The only experimental evidence for such sprouting was claimed in experiments with monkeys. After hemisection of the spinal cord, more afferential terminal knobs were seen in the side of the spinal cord which had been hemisectioned. According to the authors, this afferential sprouting might be responsible for the development of spasticity on the hemisectioned side.[44]

After all the preceding discussion, I might be in a better position to give a rather simple visualization of the mechanism of "volitional" movements, or at least of "purposive" movements. At the motor cortex, as the highest transactional level, perceptional impulses converge, which initiate the intended movement through the pyramidal-extrapyramidal system and through the gamma efferent system. This movement, for example walking, could continue by the self-regulating mechanisms of lower levels of transaction until new interferences from the cortex alter or even stop the walking pattern. Thus, even in so-called "volitional movements," the main nervous energy is expended at lower transactional levels of the CNS.

Before closing, I shall emphasize another aspect of learning new motor skill which I have not mentioned yet and for which no good explanation can be offered. Whatever the true mechanism of learning, it is obvious that we learn new "movement patterns" and not a sequence of a mosaic of activation of specific muscles. It is well known that every "right-hander" can learn quickly to write with the right foot or even with a pencil held in the mouth. Usually the first attempt results in readable writing, although it might not look too beautiful. The difficulties which the right-hander encounters when he tries to use a left limb, are due to the fact that writing with left hand or foot does not require the identical movement pattern of the right, but the "mirror" pattern. However, if he tries with the left to write "mirror" writing (from right to left), the visual control, which is trained to control writing from left to the right, interferes. Mirror writing with the left hand becomes easy for most right-handers as soon as they do not look directly at the paper but at a mirror kept to the right of the paper. Here they see the mirror writing produced by the movement pattern of normal writing with the right, reversed into apparently normal writing. Under this condition, the visual control helps left-hand writing in the same manner as it is used in right-hand writing. There are many other examples indicating that learning of new motor action is at least partially a learning of pattern, independent of what muscles are used. This learning in patterns probably also offers a partial explanation of the so-called "cross-education" for skill.[45, 46]

REFERENCES

1. Walshe, F. M. R.: Some problems of method in neurology, Canad. M. Ass. J., 68:21, 1953
2. ———: On the interpretation of experimental studies of cortical function: with special reference to the "operational view" of experimental procedures, Brain 74:249, 1951
3. Phillips, C. G.: Cortical motor threshold and the threshold and distribution of excited Betz cells in the cat, Q. J. Exp. Physiol. Lond., 41:70, 1956
4. ———: Intracellular records from Betz cells in the cat, Q. J. Exp. Physiol. Lond., 41:58, 1956
5. Geilhorn, E.: The influence of alterations in posture of the limbs on cortically induced movements, Brain. 71:26, 1948
6. Denny-Brown, D.: Disintegration of motor function resulting from cerebral lesions, J. Nerv. Ment. Dis., 112:1, 1950
7. Bancroft, F. W. and C. Pilcher: Surgical Treatment of the Nervous System, Philadelphia, 1946
8. Bucy, P. C.: The Precentral Motor Cortex, Urbana, 1944
9. Wall, P. D., W. S. McCulloch, J. Y. Lettvin and W. H. Pitts: The terminal arborization of the cat's pyramidal tract determined by a new method, Yale J. Biol., 28:457, 1956
10. Lloyd, D.P.C.: The spinal mechanism of the pyramidal system in cat, J. Neurophysiol., 4:525, 1941
11. Mettler, F. A.: The experimental anatomophysiologic approach to the study of diseases of the basal ganglia, J. Neuropath., 14:115, 1955
12. Livingston, W. K., F. P. Haugen, and J. M. Brookhart: Functional organization of the central nervous system, Neurology, 4:485, 1954
13. Penfield, W.: Mechanisms of voluntary movement, Brain, 71:1, 1954
14. Coghill, G. E.: Anatomy and the Problem of Behavior, Cambridge, 1929
15. Windle, W. F.: Physiology of the Fetus, Philadelphia, 1941
16. ———: Genesis of somatic motor functions in mammalian embryos, Physiol. Zool., 17:247, 1944.
17. Caramichael, L.: The phylogenetic development of behavior pattern, Ass. Res. Nerv. & Ment. Dis., 23:87, 1954
18. Foerester, O.: Die Physiologie und Pathologie der Coordination, Jena, 1902
19. Gray, J. and H. W. Lissmann: Further observations on the effect of deafferentation on the locomotory activity of amphibian limbs, J. Exp. Biol., 23:121, 1946
20. ———: The coordination of limb movements in the amphibia, J. Exp. Biol., 23:133, 1946
21. Geilhorn, E.: The effect of muscle pain on the central nervous system at the spinal and cortical level, Lancet, Lond., 74:242, 1944
22. Gardener, E. D., and F. Morn.: Spinal pathways for projection of cutaneous and muscular afferents to the sensory and motor cortex of the monkey, Am. J. Physiol., 174:149, 1953.
23. Levine, M. G., and H. Kabat.: Proprioceptive facilitation of voluntary motion in man, J. Nerv. & Ment. Dis., 117:199, 1953
24. Geilhorn, E. and D. A. Johnson: Further studies on the role of proprioceptors in cortically induced movements of the foreleg in the monkey, Brain, 73:512, 1950
25. Holst, E. v.: Neue Gedanken und Versuche zur Sensomibilität, Acta neuroveget., 12:338, 1955
26. Küpfmüller, D. and G. Poklekowski: Der Regelmechanismus willkürlicher Bewegungen, Zschr. Naturforschg, 11b:1, 1956
27. Sherrington, C. S.: The Integrative Action of the Central Nervous System, Cambridge, 1947
28. Loofbourrow, G. N. and E. Geilhorn: Proprioceptively induced reflex patterns, Am. J. Physiol., 154:433, 1948

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29. ———: Proprioceptively induced reflex patterns. J. Neurophysiol., 12:435, 1949
30. Cohen, L. A.: Localization of stretch reflex. J. Neurophysiol., 16:272, 1953
31. McCouch, G. P., I. D. Deering and T. H. Ling.: Location of receptors for tonic neck reflexes. J. Neurophysiol., 14:191, 1951
32. Boyd, I. A. and T. D. Roberts: Proprioceptive discharges from stretch-receptors in the knee-joint of the cat. J. Physiol., 122:38, 1953.
33. Cohen, L. A.: Activity of knee joint proprioceptors recorded from the posterior articular nerve. Yale J. Biol. Med., 28:225, 1956
34. Thompson, L. and E. Gellhorn: The influence of muscle pain on spinal reflexes. Proc. Soc. Exp. Biol., N. Y., 58:105, 1945
35. Granit, R.: Receptors and Sensory Perception. New Haven, 1955
36. ———, B. Holmgren and P. A. Merton: The two routes for excitation of muscle and their subservience to the cerebellum. J. Physiol., 130:213, 1955
37. ———, and B. Holmgren: Two pathways from brain stem to gamma ventral horn cells. Acta physiol., scand., 35:93, 1955
38. Pavlov, I. P.: Conditioned Reflexes. New York, 1927
39. Konorski, J.: Mechanisms of learning. Symp. Soc. Exp. Biol., 4:409, 1950
40. Shurrager, P. S. and H. C. Shurrager: The rate of learning measured at a single synapse. J. Exp. Psychol., 36:347, 1946.
41. Eccles, J. C.: The Neurophysiological Basis of Mind. The Principles of Neurophysiology. Oxford. 1953.
42. Bayliss, W. M. Principles of General Physiology. Ed. 4. London, 1924. p. 471
43. Pomerat, C. M.: Dynamic neurogliology. Texas Rep. Biol. Med., 10:884, 1952
44. McCouch, G. P., G. M. Austin, and C Y. Liu: Sprouting of new terminals as a cause of spasticity. Am. J. Physiol., 183:642, 1955
45. Hellebrandt, F. A. Cross education: ipsilateral and contralateral effects of unimanual training. J. Appl. Physiol., 4:136, 1951
46. Walters, C. E.: The effect of overload on bilateral transfer of a motor skill. Phys. Ther. Rev., 35:567, 1955

Five Year Study of Treatment of Bromidrosis and Epidermophytosis with Copper Iontophoresis

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INTRODUCTION

Where chronically ill patients are hospitalized, the care of the feet becomes important. Patients in such institutions usually have to walk comparatively great distances, use common showers and, in spite of all precautions, these patients are inclined to walk barefoot when getting in and out of bed. At the Veterans Administration Hospital, Bedford, Massachusetts, an 1800 bed neuropsychiatric hospital, the patients' feet are examined periodically by the podiatrist. Among the various conditions found, bromidrosis and epidermophytosis are common in more than 20 per cent of the patient population.[1] The present paper reports the findings of a 5 year study of 154 patients who received treatment of these conditions with copper iontophoresis.

Fungus infection of the hands and feet treated by copper iontophoresis has been reported frequently in the literature. Lowenfish[2] has reported the treatment of chronic dermatitis by cataphoresis with tap water. In 19 cases in which the diagnosis of dermatophytosis was established by microscopic and cultural examination he used 12 different chemicals of which copper was one. Lowenfish writes that a few patients showed some clinical improvement but that fungi could still be found at the end of the course of treatment. His conclusion was that the method is of no value in the dermatomycoses. On the other hand, Downing[3] states that fungi may be found on normal skin. Furthermore, Haggard, Strauss, and Greenberg,[4] note that it is not the presence of the fungi but the inflammatory process caused by them which constitutes dermatophytosis. They further specify that their results were based on clinical changes occurring in patients when dermatophytosis was treated by copper electrically introduced into the skin. One significant aspect indicated by Haggard, et. al., was that nearly all patients reported a lessening of the moisture in the skin after the first treatment. We feel that this is important since it is the treatment of the excessive sweating of the feet, i.e., bromidrosis, that we are mainly interested in, concomitant with or without the dermatophytosis. Greenwood and Rockwood[4] report that copper sulfate introduced into the skin is neither fungicidal nor

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fungistatic. When there is clinical improvement from this treatment it is due to some factor or factors other than copper sulfate.

TREATMENT PROCEDURE

A modified Haggard's technic, suitable for psychiatric patients, was used for bromidrosis or epidermophytosis. Briefly, both of the patient's feet were immersed in a 2 per cent solution of copper sulfate contained in a rectangular enamel basin about 4 inches deep. A copper electrode was placed in the solution and the other end was connected to the positive terminal of the generator. The dispersive electrode was connected to the negative terminal of the generator and consisted of an asbestos pad of sufficient size to allow the patient to sit on it. This method was used to prevent the patient from inadvertently breaking the current and receiving a mild electric shock. Eight to 10 milliamps of current were used and the duration of treatment was 20 minutes. Following treatment each patient was required to put on a clean pair of white socks.

When possible, each patient was treated daily; 5 to 10 treatments were regarded as the maximum course necessary. For those patients described clinically as having epidermophytosis further treatments were given as indicated by the individual cases.

CLINICAL DESCRIPTION OF BROMIDROSIS AND EPIDERMOPHYTOSIS

The clinical picture of bromidrosis usually presents one or several of the following manifestations: most common is an offensive odor of the feet; an excessive amount of perspiration; symmetrical erythema, and in some instances maceration or denudation. The result from treatment was considered a clinical "cure" when the patient's feet showed a dry normal skin, no erythema, and no odor.

Clinically, epidermophytosis of the feet, on the other hand, shows relatively less perspiration, usually no odor, and, in varying degrees, any one or more descriptive types of conditions as described by Haggard, i.e., erythematous, scaly, desquamating, denudated, macerated, fissured, vesicular, and pustular eruptions. A clinical "cure" of epidermophytosis was considered to have been achieved when the patient showed dry, normal skin.

Treatment was given to 154 patients over the past 5 years. Of these, 109 patients were diagnosed as having bromidrosis of the feet with or without maceration. The remaining 45 cases were clinically diagnosed as epidermophytosis. Of the 154 patients most had received chemotherapy for these conditions without success before starting on copper sulfate iontophoresis. In a few instances some cases were considered too severe to start chemotherapy and were given a course of copper sulfate iontophoresis initially. The minimum course was a series of 5 to 10 treatments; after this number of treatments 58 per cent of the 109 patients showed a clinical "cure." Table I shows the results of treating patients who had bromidrosis which recurred over varying periods of time and required further treatment with copper sulfate iontophoresis. With further treatment an additional 35 per cent showed a clinical "cure," 6 per cent "improved," and 1 per cent showed a "poor" response.

CASE DISCUSSION OF PATIENTS WITH BROMIDROSIS

Some of the severe (and otherwise), noteworthy cases are presented here.

Patient 5 had a moderate case of bromidrosis with maceration and symmetrical erythema of both feet. After a series of 10 treatments the patient's feet had healed clinically but a recurrence was noted in 4 weeks; another course of 10 treatments was administered, and again the patient's feet had improved to a point where further treatment was not indicated (at that time). After 4 weeks there was another occurrence; when this was followed by a series of treatments he required no more for 12 weeks. Following the last series of treatments the patient was free of symptoms and had obtained maximum benefit.

Patient 11 has a severe case of bromidrosis and a total of 65 treatments have been given over a period of 3 years with the remissions as noted. This patient will continue to need treatments periodically to keep his symptoms under control.

Patient 24 showed improvement after 3 treatments and then returned for 4 more. However, treatment was discontinued because of his fear of electricity.

Patients 25 and 37 refused any further treatment and consequently were returned to the wards where chemical treatments were instituted.

Patient 29 became overactive and treatment was discontinued for a short period. He subsequently took the remainder of the treatments and his symptoms were relieved.

Patient 34 had a series of 5 treatments with improvement. There was, however, some maceration still present. Ten weeks later he was referred again and was given 10 additional treatments. While moderately severe maceration was still

HYPERHIDROSIS - TABLE I

Patient	Degree	Treatments	Result	Recurrence	Clinical Type	No. of Repeated Rx.	Results	Recurrence
1.	Mild	5	Healed	2 yr. 5 mos.	-	5	Healed	None
2.	Mild	5	Healed	10 "	-	10	Healed	None
3.	Mild	5	Healed	2 wks.	-	5	Healed	6 Mos.
4.	Severe	10	Healed	1 yr. 19 mos.	-	5	Healed	None
5.	Mod.	10	Healed	4 wks.	Macerated Erythema	10	Imprvd	4 wks.
						10	Imprvd	12 wks.
						10	Imprvd	12 wks.
						10	Imprvd	-
6.	Mild	5	Healed	24mos.	-	5	Healed	None
7.	Mod.	10	Imprvd	7 wks.	Macerated	5	Healed	None
8.	Mild	4	Imprvd	8 wks.	-	10	Healed	18 mos.
						10	Healed	None
9.	Mild	5	Healed	31 mos.	-	5	Healed	None
10.	Mild	5	Imprvd	13 wks.	-	5	Healed	None
11.	Severe	5	Healed	16 wks.	-	5	Healed	4 wks.
						5	Healed	23 wks.
						5	Healed	16 wks.
						10	Healed	24 wks.
						10	Healed	24 wks.
						10	Healed	24 wks.
						10	Healed	16 wks.
						10	Healed	-
12.	Mild	5	Healed	28 wks.	-	10	Healed	None
13.	Mod.	10	Healed	8 wks.	-	10	Healed	28 wks.
						10	Healed	None
14.	Mild	5	Healed	28 wks.	-	5	Healed	1 yr. 1 mo.
						5	Healed	None
15.	Mild	4	Healed	3 yrs. 1 mo.	-	5	Healed	16 wks.
						10	Healed	None
16.	Mod.	5	Healed	20 wks.	Macerated	10	Healed	12 wks.
17.	Mild	5	Healed	12 wks.	-	3	Healed	None
18.	Mild	5	Healed	23 wks.	Macerated	5	Healed	None
19.	Mild	5	Healed	17 wks.	Erythema	5	Healed	24 wks.
						5	Healed	None
20.	Severe	10	Imprvd	4 wks.	Macerated	5	Healed	None
21.	Mild	5	Healed	32 wks.	-	5	Healed	None
22.	Mild	5	Imprvd	44 wks.	Macerated	5	Healed	12 wks.
						5	Healed	None
23.	Mild	5	Imprvd	14 wks.	Macerated	5	Healed	12 wks.
						10	Imprvd	32 wks.
						10	Healed	None
24.	Mild	5	Healed	48 wks.	Macerated	7	Imprvd	-
25.	Mild	2	Patient refused further treatment					
26.	Mild	5	Healed	14 wks.	Maceration	5	Healed	36 wks.
27.	Mild	5	Healed	40 wks.	-	5	Healed	None
28.	Mild	5	Healed	2 yrs. 8 wks.	Macerated	5	Healed	None

BROMIDROSIS - TABLE I - Continued

Patient	Degree	Treatments	Results	Recurrence	Clinical Type	No. of Repeated Rx.	Results	Recurrence
29.	Mild	5	Healed	8 wks.	Macerated Erythema	2	Patient Hyperactive Rx. terminated	
						12	Healed	None
30.	Severe	10	Healed	12 wks.	-	10	Healed	None
31.	Mild	5	Healed	2 yrs. 8 wks.	-	5	Healed	None
32.	Mild	5	Healed	2 yrs. 6 mos.	Macerated	5	Healed	None
33.	Mild	5	Healed	1 yr. 6 mos.	Macerated	5	Healed	None
34.	Mild	5	Imprvd	10 wks.	Mac.Eryth.	10	Imprvd	1 yr.5 mos.
35.	Mild	5	Healed	2 yrs. 8 mos.	Macerated	5	Healed	None
36.	Mild	5	Healed	2 yrs. 10 mos.	-	5	Healed	None
37.	Mild	5	Healed	40 wks.	-	5	Healed	8 wks.
						5	Healed	12 wks.
						2	Refused further Rx.	
38.	Severe	10	Healed	6 wks.	-	5	Healed	48 wks.
						2	Change in pts. cond. No further Rx.	
39.	Mild	5	Healed	1 yr. 3 mos.	-	10	Healed	None
40.	Mild	5	Healed	8 wks.	Mac.Eryth.	5	Healed	1 yr.2 wks.
						5	Healed	None
41.	Mild	5	Healed	8 wks.	Mac.Eryth.	5	Healed	16 wks.
						5	Healed	None

present it was felt that maximum benefit had been obtained. The patient was seen again 1 year and 5 months later when 10 treatments were given, but the treatment was terminated since no significant improvement was noted. This was attributed partly to the fact that the patient would not submit to taking the treatment properly, i.e., pulling his feet out of the solution, standing up, etc.

Patient 38 had good results but on his last series of treatments a change occurred in the patient's psychiatric condition and treatment was consequently discontinued.

Result of Treatment of Epidermophytosis

The clinical data and results of treatments for patients with epidermophytosis are presented in Table II.

In 45 cases with clinical epidermophytosis 26 (58 per cent) showed a clinical "cure" with 10 or less treatments. Nine additional patients (20 per cent) required more than 10 treatments to effect a clinical "cure." Three patients (6 per cent) showed clinical improvement and 7 patients (16 per cent) showed a "poor" response.

Case Discussion of Patients With Epidermophytosis

Patients 2, 12, 14, 21, 22, 27, and 30 did not respond to treatment and therefore were designated "poor." Patients 42 and 43 showed after extensive treatment an over-all improvement but not enough to warrant being called "improved," consequently we designated them as "poor."

Patient 3 showed improvement and in 4 weeks was again started on a series of treatments which ended with a clinical "cure."

Patient 5, 6, continued to have a small macerated area which was treated chemically on the wards; these were designated "improved" as the majority of the affected areas had been cleared.

Patient 7 showed a clinical "cure" following his initial treatments but had a recurrence in one month; following one treatment the patient refused to take any further treatments.

EPIDERMOPHYTOSIS - TABLE II

Patient	Degree	Treatments	Result	Recurrence	Clinical Type	No. of Repeated Rx.	Results	Recurrence
1.	Mild	5	Healed	None	Macerated	-	-	-
2.	Severe	10	Poor	-	Mac.Denuded	-	-	-
3.	Mild	6	Imprvd	4 wks.	Erythema	30	Healed	None
4.	Severe	32	Healed	None	Mac.Fissures Scaling		-	-
5.	Mild	7	Imprvd	None	Fissured	-	-	-
6.	Mild	7	Imprvd	None	-	-	-	-
7.	Mild	4	Healed	1 mo.	Scaling	1	Refused further Rx.	
8.	Mild	4	Imprvd	13 wks.	Scaling	2	Imprvd	-
9.	Mild	5	Healed	None	-	-	-	-
10.	Severe	7	Healed	24 wks.	Denuded Scaling, Mac.Erythema	56	Healed	None
11.	Mild	5	Healed	None	Scaling	-	-	-
12.	Mild	3	Healed	None	Desquamnation	-	-	-
13.	Mild	7	Healed	None	Scaly Erythema	-	-	-
14.	Mild	7	Healed	None	-	-	-	-
15.	Mild	5	Healed	None	-	-	-	-
16.	Severe	9	Healed	None	Mac.Denuded	-	-	-
17.	Severe	57	Imprvd	None	Erythema Mac.	-	-	-
18.	Mild	5	Healed	None	Fissured-Scaly-Macerated			-
19.	Mild	5	Healed	None	Erythema-Scaly	-	-	-
20.	Mild	7	Healed	None	Fissured	-	-	-
21.	Moderate	12	Poor	None	Fissured-Scaly-Erythema-			-
22.	Moderate	14	Poor	-	-	-	-	-
23.	Mild	8	Healed	32 wks.	Mac.Fissured	60	Imprvd	-
24.	Moderate	22	Healed	None	Scaly-Fissured-Macerated			-
25.	Mild	30	Healed	None	Scaly	-	-	-
26.	Mild	5	Healed	8 wks.	Mac.Erythema	19	Healed	None
27.	Mild	6	Poor	-	Scaly	-	-	-
28.	Moderate	7	Healed	None	Fissured	-	-	-
29.	Mild	5	Healed	None	Fissures	-	-	-
30.	Severe	16	Poor	-	Erythema-Macerated		-	-
31.	Moderate	20	Healed	None	Scaling	-	-	-
32.	Mild	8	Healed	None	Scaly	-	-	-
33.	Mild	19	Healed	None	Fissure-Erythema		-	-
34.	Mild	5	Healed	None	Erythema	-	-	-
35.	Mild	7	Healed	None	Scaly	-	-	-
36.	Mild	5	Healed	None	Fissure	-	-	-
37.	Mild	7	Healed	16 wks.	Scaly Fissures	42	Healed	None
38.	Mild	8	Healed	None	Scaling	-	-	-
39.	Moderate	23	Healed	None	Mac.Fissures	-	-	-
40.	Mild	5	Healed	None	Macerated	-	-	-
41.	Mild	5	Healed	None	-	-	-	-
42.	Severe	44	Poor	-	Erythema-Scaling		-	-
43.	Severe	20	Poor	-	Scaly	-	-	-
44.	Mild	8	Healed	5 wks.	Erythema	16	Healed	None
45.	Mild	5	Healed	None	Scaly	-	-	-

Patient 8 received 4 treatments and showed a clinical improvement; he was again referred 13 weeks later and received 2 additional treatments. He had a mild irritation on the anterior surface of the great toe and a mild scaling between the fourth and fifth toes, but did not return for further treatments.

Both feet of patient 17 were severely infected.

Following an intensive treatment program of 57 treatments the patient's left foot had cleared completely but the right foot had a small amount of maceration between the fourth and fifth toes when he was discontinued as "improved." It was felt that the patient had benefitted greatly from the treatment and that further improvement could be achieved on the wards by chemical methods.

SUMMARY

1. The clinical courses and treatment of 109 cases of bromidrosis and 45 cases of epidermophytosis with copper sulfate iontophoresis have been described.
2. In the 109 cases of bromidrosis 58 per cent showed a clinical "cure" after 5 treatments. After further treatment 35 per cent showed a clinical "cure" and 6 per cent were improved, while 1 per cent still showed a "poor" response.
3. In the 45 cases with clinical epidermophytosis 58 per cent showed a clinical "cure" with 10 or less treatments. Additional treatment resulted in a clinical "cure" for another 20 per cent of this group while 6 per cent showed clinical improvement and 16 per cent showed a "poor" response to treatment.
4. The authors feel that the results of this treatment and method warrant its continuance at this hospital.

REFERENCES

1. Personal communications with Edward J. O'Brien, DSC, Staff Podiatrist, VA Hospital, Bedford, Massachusetts
2. Lowenfish, F. P.: Treatment of chronic dermatitis by a cataphoretic method. Arch. Dermat. & Syph., 37:797 (May), 1938.
3. Downing, J. G., Nye, R. W., and Cousin, S. M.: Investigation of fungous flora of apparently normal skins. Arch. Dermat. & Syph., 35:1067 (June), 1937
4. Haggard, H. W., Strauss, M. J., Greenberg, L. A.: Fungous infections of the hands and feet treated by iontophoresis of copper. J. Am. M. Ass., 112:13:1228, (April), 1939
5. Greenwood, A. M., Rockwood, E. M.: Iontophoresis of copper sulfate in cases of proved mycotic infection. Arch. Dermat. & Syph., 44:800-803 (Nov.), 1941
6. Kinnard, C. M., Riemer, D.: Physical therapy in a neuropsychiatric hospital, Phys. Ther. Rev., 36:661-664 (Oct.), 1956

Problems of Rehabilitation in a General Hospital

John L. Echternach, B.S.

Rehabilitation as commonly defined, is the restoration of the severely disabled person to his fullest physical, mental, social, and vocational usefulness. This entails employing the services of varied professions in order to return the patient to society in the best possible condition to cope with the pressures of modern living.

The general hospital is an ideal place for the rehabilitation of the severely disabled patient since it offers most of the professional services needed. Although most general hospitals are not equipped to serve the needs of the final stages of rehabilitation—vocational training and job placement—they do offer a good environment for the medical, physical, and social rehabilitation processes and the beginning of vocational rehabilitation through counseling, prevocational testing, and a good system for referral to local and state agencies. But there are many factors in the general hospital setting which may inhibit the process of rehabilitation of the severely disabled patient. These include:

1) Lack of communication between departments and professional staffs; for example, the lack of staff conferences
2) Lack of understanding of the philosophy and principles of rehabilitation
3) Scarcity of personnel (both professional and nonprofessional)
4) The need for "enlightened" leadership
5) Failure to establish goals for the patient by staff, patient, and the patient's family.

Some of these problems can be handled directly; others require a slow process of orientation and reeducation to modern concepts of pa-

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tient care. We shall discuss the problems separately, and enumerate some methods which may alleviate them.

Lack of communication. Many situations arise from this disturbing problem because one profession does not know enough about another profession's phase of the rehabilitation process. Each member of the rehabilitation team should know what the other members contribute to the total care of the patient, and learn to value the respective services to the patient. Orientation of the professional staffs regarding the capabilities and responsibilities of other specialties in the hospital will help to alleviate the problem of poor communication.

It is important to notify promptly anyone concerned with the patient of any decisions regarding the patient's care, or change in the patient's condition. This procedure can become an established routine, done by telephone, memo, or personal contact.

Communications in the hospital are greatly improved by staff conferences. The most effective way a patient can be evaluated and his progress in all areas noted, is through periodic conferences of the professional staff concerned. In an average size general hospital, this usually means discussing for approximately two hours weekly the problems that have arisen during the patient's course of rehabilitation, setting goals for each patient, arranging for a lucid and comprehensive explanation of goals to the patient and his family to insure optimum cooperation, and generally adopting a uniform approach to each patient's problems. Even when demands on personnel's time are great, advance scheduling of conferences will allow time to plan realistically for each severely disabled patient.

Lack of understanding of the philosophy and principles of rehabilitation presents a problem as old as man—advances in any field meet with a certain amount of resistance. For example, the concept of rehabilitation has to do with the patient as a whole—not merely his disability, but how he will be able to function in his home, community, and job. Treatment in the hospital is not limited to his immediate medical problems but must be aimed at the patient's return to a useful life. Often the physical therapist or occupational therapist is the person most recently exposed to new ideas in rehabilitation philosophy and technics, and on him falls the responsibility of "selling the idea" to other professional staff members. For example, the nursing service may see rehabilitation as merely adding duties to an already overcrowded schedule. but if an effort is made to show the nursing staff how rehabilitation efforts in the long run will save time and effort as the patient learns to help himself to the fullest degree, the staff will give its full cooperation.

Since good patient care depends primarily on the physician, his interest and cooperation are essential to the rehabilitation program. The physician who becomes aware of the services available to the patient both in the hospital and in the community will realize that rehabilitation efforts constitute the most realistic way to care for the severely disabled patient from both a medical and economic standpoint.

Lack of personnel is of nationwide concern in many professions. This problem can hardly be dealt with by any one hospital beyond providing good staff relationships and fair remuneration for duties performed, as well as creating an atmosphere where investigation into clinical problems is encouraged. All professions have a responsibility to "recruit" intelligent people by personal example in community relationships and by explaining the advantages of the profession.

The hospital has a responsibility to its staff in having nonprofessional personnel available as necessary, and in attracting volunteers to assist in nonprofessional duties—thus freeing professional staff members for their specialized work.

Enlightened leadership is of vital importance to any rehabilitation program. Generally this leadership will be medical since the physician is primarily responsible for the patient's welfare, and is the person who requests consultations and diagnostic services, but the leadership may vary at times depending on the patient's stage of treatment. The leadership thus may shift from physician to therapist, to counselor, to social worker, at different stages of treatment. Leadership and the fullest expression by the professional staff should be encouraged. The "guiding light" of the rehabilitation program must understand fully the implications of rehabilitation.

Lack of patient goals probably interferes with the rehabilitation process more than any other specific problem. If the goals are not known to all who are involved with the patient's care and, most important of all, known to the patient himself, everyone is literally working in the dark. The patient will feel insecure and bewildered when, with adequate previous explanation, he might have a much more satisfactory morale. Since patient goals change during the course of treatment the patient should constantly be reevaluated, and the most recently established goals be made known to all concerned. This unity of approach will usually reduce the unfavorable and restricting segmentation of activities within the hospital.

Once a goal is set after patient evaluation, everyone can work toward a common aim. If progress is slow and not up to expectations, the reason for the patient's failure to respond as expected can be more easily analyzed. Having been made aware that a goal has been set for him, the patient will probably respond to the "personal interest" taken in him, and the favorable change in the patient's morale will be an important factor in his ultimate adjustment, if not recovery. No department will be hindered inadvertently in an effort to aid a patient once a definite goal has been made known to all groups dealing with a patient.

This résumé of some of the problems of rehabilitation in a general hospital stresses the fact that the obstacles are not insurmountable—advance planning, education toward the rehabilitation process, a realization of the time-saving elements for personnel involved, and interdepartmental cooperation will provide the patient an opportunity to return to a useful place in society.

Case Reports

Four Cases of Phantom Limb Treated with Ultrasound

Marilyn Anderson, Capt., AMSC

On the basis of a preliminary report of ultrasound used for the pain of phantom limb by Ruben and Kuitert,[1] 4 cases recently were treated by ultrasound at this hospital. Treatments were given twice daily, whenever possible, at an intensity of $2W/cm^2$ for a duration of 5 to 10 minutes. Three of the cases, due to bony prominences and healing lesions, required water as a coupling agent. Heavy mineral oil was used in the third case.

CASE 1

On Feb. 28, 1957, a 20 year old male sustained a demolition charge injury which necessitated amputation of the right lower extremity. The postoperative course was complicated by a pneumonitis which delayed initiation of physical therapy until April 10. At that time, examination revealed a 4 inch BK (below the knee) stump with a small healed scar at the closure site. The patient complained of phantom pain characterized by sensations of cramping and tingling. On May 3, a course of ultrasound to the stump was begun. After two treatments the patient reported total relief of the cramping of the toes, and after six treatments all phantom sensation had disappeared.

CASE 2

A 22 year old male was involved in a helicopter crash on April 29, 1957. Having been struck by a piece of flying rotor blade, he sustained a traumatic amputation of the right lower extremity and a crushing injury to the left foot. He was admitted to this hospital on May 2, 1957, with a revised healing BK stump, and on May 6 daily physical therapy was initiated on the ward. When first seen in the clinic on May 23 the patient complained of burning sensations of the stump with phantom cramping. This pain interfered with sleep and further complicated recovery which already had been retarded by frequent débridement procedures to the left foot. After approximately 8 treatments to the stump, over a period of 17 days, only slight residual stump pain remained. There was complete relief of phantom limb.

CASE 3

A 20 year old male was injured in a motorcycle accident on July 13, 1957, which resulted in a traumatic amputation above the right knee. Admitted to this hospital on July 26, he was sent to the Physical Therapy Section for exercise and relief of phantom limb. Examination revealed an abnormally large, healed AK (above the knee) stump. The constant throbbing and cramping of the phantom limb— "as if the toes were being flexed to meet the heel," were severe enough to interfere with sleep. Since the stump was free of bony prominences, ultrasound was given with oil as the coupling agent. The first two treatments administered to the stump brought no relief, so the third was applied along the course of the sciatic nerve from the sciatic notch to the stump end. The patient reported "a feeling of warmth in the foot" during the application, with a subsequent absence of throbbing and cramping, although phantom sensation of the entire foot persisted. After the fourth treatment there was a return of severe pain but no change was made in method, and improvement was reported the next day. Slow improvement continued until the patient was sent to the United States after having had a total of 11 treatments. At that time there was a slight "pins and needles" sensation with occasional throbbing.

Physical Therapy Section, 98 General Hospital, APO 34, New York, N. Y.

CASE 4

On August 8, 1957 a 25 year old male sustained a traumatic amputation of the distal half of the distal phalanx of the right thumb when a grenade simulator exploded in his hand. After débridement, the wound was closed primarily with a full-thickness skin graft. Physical therapy was started upon removal of the stitches 11 days later. At that time the patient's only complaint was phantom pain upon movement of the thumb. This consisted of a feeling of tearing out of the nail and a downward pressure on the cuticle. After two ultrasound treatments administered under water, pain was present only upon pressure to the stump. After three treatments all nail pain and sensation had disappeared, but slight cuticle pain remained. At the end of the fifth and final application, cuticle pain was present only upon pressure to one small area of the stump.

CONCLUSION

While it may be said that phantom limb in the early stages of recovery is normal and of no immediate consequence, the pain nevertheless can cause distress to the patient and often becomes chronic. It appears from observation of these 4 cases that ultrasound is of some benefit in the relief of this pain; however, since no follow-ups were available due to the early evacuation of the patients, the results are not conclusive.

REFERENCES

1. Rubin, D., and Kuitert, J. H.: Use of ultrasonic vibration in the treatment of pain arising from phantom limbs, scars and neuromas: A preliminary report. Arch. Phys. Med., 36:445 (July), 1955

Suggestions from the Field

Portable Board for Roller Skating Exercises

Mary W. Dempsey

A roller skating board mounted on legs with casters was suggested by us and constructed by the station carpenters; over a period of several years of use it has proved successful and a convenience to the physical therapists.

The basic design of this board is similar to the overbed tables used on the wards; i.e., it is a table with four legs, each supported on a caster. The total height of 34 inches permits it to fit over the treatment plinths, which are 30 inches high and covered with mattresses 3 to 4 inches thick. The legs of this table are placed 31 inches apart to fit over the 30 inch wide treatment plinths. The legs of the roller skating table are braced on the outside so that when the table is pushed over the treatment plinth there is no interference.

The board (54 by 30 inches) is so constructed that it will not warp. It is of ¾ inch plywood with a top layer of ¼ inch tempered masonite applied to the plywood with "weldwood" glue. It is then waxed to minimize the noise of the roller skate. On the front of the board, attached by hinges, is a small shelf 20 inches long and 8 inches wide which is of the same masonite and plywood construction. This hinged shelf can be raised and is the part of the table first slipped over the plinth. When the table is in proper place, the free edge of the shelf rests on the mattress; the shelf slanting slightly provides a gradual rise from the mattress to the table top and serves as a comfortable support under the patient's thigh. Figure 1 shows the board with hinged shelf mounted on legs.

Roller skating exercises are done in the usual fashion. We use a roller skate originally designed by George Heos, a therapist at Cushing VA Hospital, and made in the orthopedic shop of that hospital.[1] Attached to the roller skate on either side is a cord; for flexion exercises the patient can pull on both cords for self administered passive exercises. In order to facilitate passive abduction or adduction exercises, the table top is supplied with two small pulleys, one attached to the center of either side of the board by a bolt and nut. By pulling the cords through these pulleys, the patient is able to give himself active assistive or passive roller skating exercises.

The table is used for exercises in the treatment of hip arthroplasties, meniscectomies, fractures, and other traumatic and surgical conditions of the hip and knee joint. Its advantage lies chiefly in its sturdiness and mobility. Instead of lifting and carrying the large, heavy, old type board, the physical therapist simply wheels the table over

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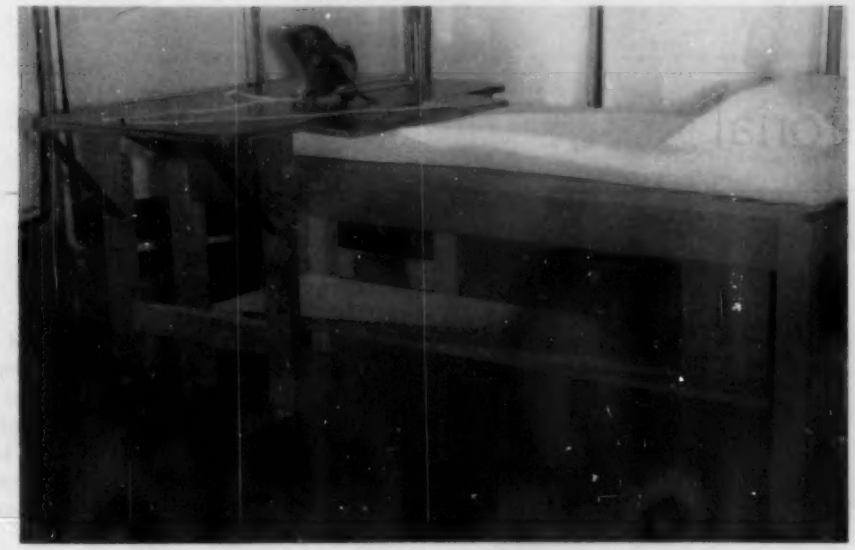

Figure 1. Board wheeled over treatment plinth.

the end of the plinth where the patient is being treated, locks the casters, and proceeds with the exercise regimen.

Following surgery the majority of patients who have had arthroplasties and meniscectomies are put in beds with Balkan frames. Until these patients are able to come to the Physical Therapy Clinic for treatment, they are treated on the wards. The same type roller skating board is used, except that it has only one pedestal for support since it cannot slide over the foot of the bed, but must be wheeled over the bed from the side. Figure 2 shows the board used on the orthopedic wards. A collapsible leg to support the free end of the board could be added should the end sag when not in use.

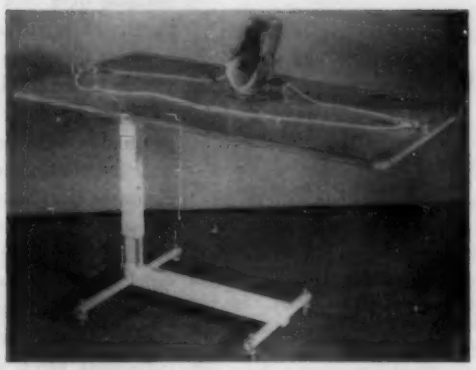

Figure 2. For use on orthopedic wards over beds with Balkan frames.

REFERENCES

1. Heos, George: An exercise device for treatment of orthopedic and neurological conditions of lower extremities, Am. J. Phys. M., 8:3-6 (Jan.-Feb.), 1954

Editorial

The Physical Therapist and the Community

Those of us who are privileged to live in this exciting and complicated modern world are reminded repeatedly of our interdependence upon each other. Our responsibilities to our families and neighbors are often quite personal and because of their immediacy, we are apt to forget that we also have responsibilities of a broad nature not only to our government, but also to the many institutions in our social community. As members of the health professions, we have much to contribute.

The public is greatly interested in health and looks to the medical profession and allied groups for leadership, not necessarily at the level of the patient-doctor relationship, but rather at a community or national level. It is here that the effort occasionally breaks down because of a lack of understanding of the complex nature of community organization.

What then is the role of the physical therapist in the community? Active membership and interest in one's own professional societies is of fundamental importance. The knowledge and wisdom within a profession must be brought together within the professional societies and transmitted when needed into appropriate local or national channels of communication. It is in this way that physical therapists can collectively influence health standards both locally and nationally. Such participation is, however, not enough. By itself it may quickly be interpreted by others as a selfish form of group effort and may, as a result, fail to exert the influence which is needed. It seems to me that such an unfortunate effect can be prevented if individual physical therapists volunteered to become active members in community organizations, particularly those concerned with health. Physical therapists should volunteer for committee work for health planning in social and health service agencies. Visiting Nurse Associations, Cancer Societies, associations for the disabled, and many others will welcome participation of physical therapists in working with their problems. The people who are greatly interested in these and similar societies will, through this participation, learn what a physical therapist is. Nurses have had a longer experience than most of the health professions in this form of community participation. I am confident that this has been an important factor

Editorial

in enhancing the esteem of nursing among many people.

The lay public because of its great interest in health can easily be "taken in" by charlatans and those who operate on the fringe of honesty and propriety. Responsible members of the health professions, particularly the physical therapists, have a real duty to personally lead the public away from these pitfalls. Active participation in community organization by the physical therapist is a most effective way to indirectly exert this control.

Physical therapists, therefore, not only have a personal and professional life, but also a community life in which they are able to influence the health and welfare of many people. It is a paradox that community leadership rather than professional leadership often determines major health decisions. Unless the health professions participate in community leadership, real progress may be impeded by negative forces.

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Lt. Col. Olena Cole, AMSC, member of the Association and Army physical therapist since her graduation from Walter Reed in 1938, died suddenly in El Paso, Texas on April 16, the birthday of the Army Medical Specialist Corps. Colonel Cole who was a constant contributor to chapter activities was one of the first physical therapists to go overseas during World War II when she was attached to the 5th General Hospital.

Prior to obtaining her physical therapy education she received her B.S. in physical education from MacMurray College for Women in Jacksonville, Illinois.

She served tours of duty at various Army Hospitals including Fort Bragg, Fitzsimons, Valley Forge, Letterman, Brooke and William Beaumont. She earned a master's degree from the University of Wisconsin. She was a charter member of the Carolina Chapter; and had served as a director of the Colorado Chapter; Education Chairman, Northern California Chapter; Chairman, Central District Texas Chapter. She had assignments on chapter conference committees in 1951 in Colorado and 1952 in Philadelphia. Colonel Cole also took part as a conference program participant in Los Angeles in 1954. She was the author of "The Physical Therapist Overseas" published in the January-February, 1947 issue of the *Physical Therapy Review* and co-author with Walter J. Treanor and Rose Dabato of "Selective Reeducation and the Use of Assistive Devices" published in December 1954.

Miss Cecile Fisher of New Orleans passed away the week of March 17. She was a member of the Louisiana Chapter and had been an Association member since 1945. Miss Fisher was self employed and was a graduate of the Touro Infirmary School of Nursing. She obtained her physical therapy certificate and M.A. degree at Columbia University.

Miss Martha Gill died suddenly on January 31. She was both a physical and occupational therapist and was a member of the Association from 1927 to 1949 and from 1954 to the present. At the time of her death she was working at the Forest Park School of Special Education, Orlando, Florida, as an occupational therapist cooperating with physical therapy. She obtained her physical therapy training at the University of Michigan in 1926 and graduated from the Philadelphia School of Occupational Therapy in 1931. Her work experience was varied and interesting with assignments in Michigan, California, and Indiana. It also included a two year assignment as Occupational Therapy Consultant to the Crippled Children's Division of the State Department of Public Welfare of Indiana and one year at the occupational therapy school, the Amerind, in Bombay, India.

The Florida Chapter has established the Martha Gill Memorial Scholarship Fund in her honor.

Mrs. Goldie Grear Harding passed away in San Luis Obispo, California, on April 17 following a long illness. Mrs. Harding had been a member of the Association since 1928 when she received her physical therapy certificate from Harvard. She was a physical therapist at Mayo Clinic from 1928 to 1930. From 1930 to 1942 she worked at Milwaukee Passavant Hospital in Wisconsin where she was one of the early members of the Wisconsin Chapter and served as Secretary. Mrs. Harding then took the one year postgraduate course at Georgia Warm Springs Foundation and was on the staff for one and half years. Following that she was employed at the Carrol Clinic, Dallas; St. Joseph Hospital, Denver; Orthopaedic Hospital, Los Angeles; and most recently at the French Hospital, San Luis Obispo.

C. Constance Wipper passed away in Chicago on Jan. 19, 1958, following a long and severe illness. Miss Wipper received her physical therapy certificate at Children's Hospital, Los Angeles, in 1938. Her physical therapy experience included positions at Mercy Hospital, Sacramento, California; Green Bay Orthopedic School, Green Bay, Wisconsin; University of Chicago Clinics; Eau Claire Orthopedic School, Eau Claire, Wisconsin; and Sault Ste. Marie School, Sault Ste. Marie, Michigan. Miss Wipper had been a member of the Association since 1938.

The following is excerpted from the bulletin of the Norwegian American Hospital, Chicago, in which Dr. Manuel Lichtenstein wrote of Miss Wipper's service to humanity. "With intelligence, skill, and understanding she gave comfort and courage to those who were in great need of physical help to regain strength, health, and the ability to return to work. When she learned that her life expectancy was limited because of a fatal illness, she faced her future with fortitude and resolution. Her charming smile and sense of humor never left her until the very end. Before her death two decisions were as characteristic as were the acts of her entire lifetime. She willed her eyes to the Society for the Prevention of Blindness with the hope that some blind person might change scarred or opaque corneas for two that were crystal clear; and she willed her body to a medical school for scientific study to aid further in the struggle to learn more of the disease that caused her death."

On Jan. 30, 1958, word was received from the sister of Constance Wipper as follows: "The Eye Bank advised me that on account of Constance's eyes, two persons have sight, and two others were given the vitreous fluid."

Marriages

Jane B. Cartwright, of Wright-Patterson AFB, Ohio, to Robert W. Morgan, Dayton, Ohio.
Margaret J. Cook, of Gallipolis, Ohio, now Mrs. Margaret C. Johnson, Gallipolis.
Jean F. Cutler, of Denver, Colo., now Mrs. Jean C. Clauss, Denver.
Maria S. deBruine, of Rockville, Md., now Mrs. Maria deB. Kyne, Washington, D. C.
Helen Dobbin, of Coatesville, Pa., now Mrs. Helen D. Cully, Coatesville.
Nellie A. Gardy, of Brookfield, Ohio, to Robert L. Sutherland, Brookfield.
Ruth Gervis, of Mt. Vernon, N. Y., to Robert Cruz, Atlantic City, N. J.
Patricia J. Gibson, of Madison, Wis., to William G. Marshall, Portsmouth, Va.
Lois Goldberg, of Evanston, Ill., now Mrs. Lois G. Rubin, Chicago, Ill.
Elizabeth N. Gould, of Cape Elizabeth, Me., now Mrs. Elizabeth G. Shea, Boston, Mass.
Elizabeth Graham, of Pittsburgh, Pa., now Mrs. Elizabeth G. Luchsinger, Pittsburgh.
Helen F. Hemphill, of Cleveland Heights, Ohio, to Christian Waag, Jr., Cleveland, Ohio.
Merrill E. Kirkland, of Los Angeles, Calif., to James C. Garlington, Los Angeles.
Liv Lonning, of Kansas City, Mo., now Mrs. Liv L. Brena, Kansas City.
Frances Maloney, of San Diego, Calif., to M. J. Mehling, San Diego.
Margaret A. McIntosh, of Dallas, Tex., now Mrs. Margaret M. Carlton, Dallas.
Ann McKenney, of Minneapolis, Minn., now Mrs. Ann M. Fischer, Bloomington, Minn.
Stewart Morris, of Green Bay, Wis., to Elizabeth A. Davis, Chaffey's Locks, Ont.
Marian L. Nowak, of New Brunswick, N. J., to Daniel G. Van Winkle, Fort Eustis, Va.
Nancy Peterson, of LaGrange, Ill., to George A. Traunicek, Lyons, Ill.
Jane Poisal, of Martinsburg, W. Va., to Jack R. Downey, Martinsburg.
Patricia A. Putnam, of San Francisco, Calif., to J. Benacquista, Dracut, Mass.
Betty R. Pritchett, of St. Paul, Minn., to B. J. Mumm, St. Paul.
Cornelia A. Ross, of Chicago, Ill., to Lawrence E. MacIver, Milwaukee, Wis.
Jenell Smith, of Greenville, S. C., to Rion D. Vassy, Greenville.
Mary E. Timberlake, of New York, N. Y., now Mrs. Mary T. Neave, New York.
I. Lucille Walsh, of San Pedro, Calif., to Ralph A. Wheat, Burbank, Calif.

Association News

Chapter News

District of Columbia

The Chapter sponsored a study course in neuroanatomy this spring which consisted of a series of five two-hour lectures. Registration totalled 83. The Chapter voted at its April meeting to contribute $100.00 to the Physical Therapy Fund, Inc.

Iowa

The annual meeting was held in Des Moines with the Western District as host. An orthopedist discussed back injuries and flexion exercises, and an occupational therapist presented a physical capacities testing program. A hospital administrator was the guest speaker at the luncheon. The afternoon session was devoted to business and election of officers.

Michigan

The Chapter plans to join the Michigan Health Council. Members have been urged to watch the Council's regular TV program and to observe the scope of the Council's activities.

Michigan—Eastern District

The District sponsored two educational courses for its members this spring. One group studied pathological gaits and the second group had as its subject, Civil Defense.

New York—Western District

Programs presented this past year included correlation of physiology and therapeutic exercise and a talk on medical writing. District newsletters contained detailed reports of these programs as well as a report on the 34th annual conference and House of Delegates meetings.

Oregon

The April 1958 newsletter reports the results of a personnel policies survey conducted by the Chapter. There was a 32 per cent return of questionnaires. The items tabulated included earnings, titles of positions, vacation, holidays, sick leave, expenses defrayed including travel to Conference, and health and insurance benefits.

South Dakota

The Chapter was host to the Iowa and Nebraska Chapters in Sioux Falls, April 18-19. The program, the theme of which was "The Future of Physical Therapy," included speech rehabilitation of the aphasic, physical therapy in obstetrics, sensory disturbances in the involved upper extremity of hemiplegic children, objectives to be achieved in prescribing physical therapy for the neurological patient and the geriatric patient. The film, Proprioceptive Neuromuscular Facilitation, was shown at the close of the program.

Texas

The annual meeting was held in Houston, April 18-20, with a scientific program held on Saturday. The topics were related to lower extremity prosthetics, upper extremity orthetics, advances in cardiovascular surgery, and the contribution of the frog to physiology. Members were invited to bring their "burning questions" on "What Happens to Our $20.00?" to the business meeting on Sunday morning.

Washington

The Chapter has become a participating member of the Washington State Health Council. A "Health Careers" brochure to be published by the Council will contain information on physical therapy prepared by Chapter members.

Busily preparing for the 35th annual conference, the Tacoma area members are responsible for favors to be given to those attending the Annual Banquet.

Virginia

The March 1958 issue of the *Virginian* reveals that on the date of publication 93.5 per cent of the active members of the Virginia Chapter had given financial support to the legislative program which culminated in the passage of Senate Bill No. 35 which became law thereby regulating the practice of physical therapy in Virginia.

CONFERENCE 1958

Seattle • June 15-20 • Olympic Hotel

Business Meetings and Program Schedule

June 12, 13 and 14 — **Board of Directors Meetings**

Sunday, June 15

8:00 A.M. — 5:00 P.M. — **General Registration**
9:00 A.M. — 5:00 P.M. — Section on Education
Self Employed Section
Public Health Section
2:00 P.M. — 5:00 P.M. — Chapter Workshop
5:00 P.M. — 8:00 P.M. — **Explorers' Potlatch**—Washington State Chapter, Host

Monday, June 16

8:00 A.M. — 5:00 P.M. — **General Registration**
9:00 A.M. — 12:00 Noon — **Delegates' Registration**
10:00 A.M. — 12:00 Noon — Group Meetings—Arthritis and Rheumatism Foundation, Crippled Children's Societies, Research Group, State Examining Committees, Veterans Administration; Section on Education, Trading Post
1:30 P.M. — 4:30 P.M. — Opening Session—Greetings, President's Address
NEUROPHYSIOLOGY A PHYSICAL THERAPIST SHOULD KNOW, Ernst Fischer, M.D., Research Professor of Physiology, Medical College of Virginia
7:00 P.M. — 10:00 P.M. — **Film Theater**

Tuesday, June 17

9:00 A.M. — 12:00 Noon — **House of Delegates**
2:30 P.M. — 5:00 P.M. — PATHOLOGICAL FACTORS WHICH LIMIT PURPOSEFUL MOVEMENT, Lawrence M. Knopp, M.D., Instructor in Neurosurgery, University of Washington, School of Medicine, Seattle
PANEL DISCUSSION: AS WE SEE IT—SEMANTICS IN THEORIES OF REEDUCATION, Ernst Fischer, M.D.; Berta Bobath, Principal, The Western Cerebral Palsy Centre, Ltd., London, England; Margaret Knott, Physical Therapy Director, California Rehabilitation Center, Vallejo, California; Margaret Rood, Professor, Physical Therapy Department, University of Southern California
6:00 P.M. — 7:00 P.M. — **Reception for Board of Directors**
7:30 P.M. — **Annual Banquet**

Wednesday, June 18

9:00 A.M. — 11:00 A.M. — **House of Delegates**
2:30 P.M. — 5:30 P.M. — HOW WE DO IT — Lectures and Demonstrations, Karel Bobath, M.D., Senior Assistant Psychiatrist, Brookwood Hospital, Surrey, England, and Berta Bobath; Margaret Knott; Margaret Rood (Rotational Session)
7:00 P.M. — 10:00 P.M. — **Film Theater**

Thursday, June 19

9:00 A.M. — 12:00 Noon — THE PATIENT: ANALYSIS OF MOTOR DYSFUNCTION; PLANNING OF ACTIVITIES, CRITERIA FOR MEASUREMENT OF PROGRESS; Berta Bobath, Margaret Knott, Margaret Rood, Ernst Fischer, M.D.

PANEL DISCUSSION: TESTING AND MEASUREMENT — PURPOSES AND METHODS. William R. Duncan, M.D., Orthopedic Consultant, Crippled Children's Division, Washington State Department of Health, Seattle

Sherburne W. Heath, M.D., Director, Physical Medicine and Rehabilitation, Children's Orthopedic Hospital, Seattle.

Helen Vaughn, Coordinator of Physical and Occupational Therapy, Bureau of Maternal and Child Health, District of Columbia

Dorothy Peterson, AMSC, Staff Physical Therapist, Madigan Army Hospital, Tacoma, Washington

2:00 P.M. — 4:00 P.M. — UNDERSTANDING THE PATIENT'S EMOTIONAL REACTIONS TO DISABILITY AND TREATMENT—Herbert S. Ripley, M.D., Professor and Executive Officer, Department of Psychiatry, University of Washington School of Medicine, Seattle.

Questions will be posed by:

Ruth Cook, May T. Morrison Center for Rehabilitation, San Francisco

Martin Mundale, Elizabeth Kenny Institute, Minneapolis

Marcia Shaw, Detroit Orthopaedic Clinic, Detroit

5:00 P.M. — **Salmon Barbecue**

Friday, June 20

9:00 A.M. — 12:00 Noon — CURBSTONE CONFERENCES — Demonstrations by more than 20 physical therapists. A partial list of participants appears elsewhere in this issue.

ANY QUESTIONS? Ernst Fischer, M.D., Berta Bobath, Margaret Knott, Margaret Rood

CORRELATIVE SUMMARY OF TECHNICS, Ernst Fischer, M.D.

2:00 P.M. — 3:00 P.M. — ULTRASOUND — Justus F. Lehmann, M.D., Professor and Executive Officer, Department of Physical Medicine and Rehabilitation, University of Washington, Seattle; George Brunner, Department of Physical Medicine, University of Washington

3:30 P.M. — 5:00 P.M. — CONCURRENT SESSIONS —

Session A

STUDIES OF STRENGTH VARIATION THROUGH THE RANGE OF JOINT MOTION, Marian Williams, Ph.D., Associate Professor, Division of Physical Therapy, Stanford University; and Leon Stutzman, Research Associate, Department of Physical Therapy, Stanford University

Original Papers

An Experimental Study in the Neonatal Guinea Pig on a Possible Cause of Cerebral Palsy, Eleanor Flanagan, Research Assistant and R. Frederick Becker, Ph.D., Associate Professor, Department of Anatomy, Duke University Medical Center

Electrical Stimulation for "Spot Reducing." Study of a Single Case, Robert Babbs, Jr., Staff Physical Therapist, Provident Hospital, Chicago; and Elizabeth Wood, Assistant Professor of Physical Medicine, Northwestern University Medical School

Session B

MYOFASCIAL PAIN, John Bonica, M.D., Director, Department of Anesthesiology, Tacoma General Hospital, Tacoma, Washington.

PHYSICAL FITNESS: WHAT ARE WE FINDING? Ellen Waters, Assistant Professor, Department of Physical Education and Health Education, University of Washington

Original Papers

Responses to Physical Therapy Under a Hallucinogen, Arnold J. Isaacs, Clinical Training Supervisor; Herbert A. Margerum, Staff Physical Therapist; Louis Gast, Chief Physical Therapist; and Sidney Cohen, M.D., Chairman, Research Committee, Neuropsychiatric Hospital, V. A. Center, Los Angeles

Physical Therapy Technics for Bulbar Poliomyelitis, Viola Robins, Hazel V. Adkins, Jeanne Linquist, V. Joyce Lim and Clarence W. Dail, M.D., The Respiratory and Rehabilitation Center for Poliomyelitis, Rancho Los Amigos Hospital and The Department of Physical Medicine, College of Medical Evangelists, Los Angeles

Conference Facts

Hotel

The Olympic, Seattle's nationally known hotel, occupies a solid square block in the hub of the city. Air conditioning provided by nature.

Rates

Single rooms	$7.00 to $15.00
Double Bedded Rooms for Two	$10.00 to $18.00
Twin Bedded Rooms	$13.00 to $20.00
Suites	$30.00 to $40.00

All rooms have combination tub-shower or shower.

Hotel Reservations

Reservations should be sent directly to the Hotel Olympic at least 30 days in advance.

Note: Reservations received after all sleeping rooms in the Olympic have been taken will automatically be assigned to one of two other designated hotels. The Olympic will not guarantee space for reservations received after May 15.

Those who wish to room together should send in only one reservation card indicating the number of persons to occupy the room. The number of minimum priced rooms is limited and the hotel will acknowledge reservations within a range dependent upon availability at the time of arrival. When single rooms are filled you will be assigned a double room at a reduced rate.

Registration

Active, Inactive and Foreign Probationary Members	$6.00
Student Members	$2.00
Nonmember Physical Therapy Students	$4.00
Nonmember Graduates of Approved Schools	$15.00
Members of Physical Therapy Organizations Affiliated with the World Confederation for Physical Therapy:	
Visitors	$6.00
Residents of this country	$15.00

Nonmembers will be requested to present credentials.

You are urged to register in *advance*. If you do not register in advance you *must* present your membership card at the Conference Registration Desk. Registration forms for advance registration will be found in your dues notice.

Exhibits

Exhibits Manager: Gordon M. Marshall, 30 West Washington Street, Chicago 2. Scientific Exhibit space is assigned by the American Physical Therapy Association.

Section on Education

Vice Chairman
RUTH COOK

MARGERY WAGNER, *Chairman*

Recording Secretary
MARGARET KNOTT

Treasurer
CORRINE Q. WAY

Corresponding Secretary
CARMELLA GONELLA

Sunday, June 13 — **Williamsburg Room**

9:00 A.M. — 10:00 A.M. — VISUAL AIDS RELATING TO PHYSICAL THERAPY
Speaker: Helen J. Hislop, Graduate Student, University of Iowa

10:00 A.M. — 10:30 A.M. — Coffee Break

10:30 A.M. — 11:30 A.M. — INTRODUCTION TO COMMUNICATIONS
Speaker: Burton J. Ballard, Public Relations Director, State Bar of California

11:30 A.M. — 12:00 NOON — Break

12:00 NOON — 2:00 P.M. — Luncheon and Business Meeting

2:00 P.M. — 4:00 P.M. — WORKSHOP IN COMMUNICATIONS — PROBLEMS RELATING TO PHYSICAL THERAPY INSTRUCTION AND CLINICAL SUPERVISION
Directors: Mr. and Mrs. Burton J. Ballard

Monday, June 16 — **Pacific Room**

9:00 A.M. — 12 NOON — Trading Post — by appointment, or not; for conferences between two or in groups. Your opportunity to talk with others with similar interests! Trade your ideas, materials, and information!

The Trading Post

The proposed "Trading Post" to be held during the Annual Conference in Seattle on Monday morning, June 16, is an innovation for the Section, and it is planned especially for those members who wish an opportunity to meet informally with others. It is answering that frequently expressed wish of having a place and time to exchange ideas. Reply cards are being sent to all Section Members for indication of their interests. Suggested topics for discussion groups at the "Trading Post" are: group dynamics in clinical situations, technics of student counseling, in-service training programs, a summary of APTA-OVR Institute. Please fill

in and return your reply card as indicated. There will also be an exhibit of materials used during the clinical experience of physical therapy students, both those developed by the school and by the clinical center.

The election of three officers will take place at the business meeting of the Section on Education, which will be held at the Annual Conference in June at Seattle.

The Nominating Committee composed of Helen Kaiser, Doris Porter, and Adelaide L. McGarrett, chairman, will present the following slate:

Chairman	— Margaret Bryce
Treasurer	— Mildred Heap
Corresponding Secretary	— Virginia Whitfield

The Rules of Government of the Section provide that additional nominations may be made from the floor.

MARGERY L. WAGNER, *Chairman*
Section on Education

Curbstone Conferences

On Friday morning, June 20, 24 physical therapists will demonstrate various facilitation technics. A partial list of participants follows:

Technics as taught by Berta Bobath, Principal, Western Cerebral Palsy Centre, London, England; and, in this country, by Sarah Semans, Division of Physical Therapy, Stanford University, will be demonstrated by:

Ishuan R. McCutcheon, Physical Therapist, Division for Cerebral Palsy, Crippled Children Services, Kern County Department of Public Health, Bakersfield, California;

Bernice Ringman, Supervising Physical Therapist, Crippled Children Services, State Department of Public Health, Los Angeles;

Sarah Semans, Instructor, Division of Physical Therapy, School of Medicine, Stanford University, Stanford, California;

Ellis Thompson, Senior Therapist for Physically Handicapped Children, Sunshine School, Arlington, California. Employed by State of California Department of Public Health, Crippled Childrens Services.

Technics as taught by Margaret Knott, Physical Therapy Director, California Rehabilitation Center, Vallejo, will be demonstrated by:

Rheta C. Adams, Associate in the Division of Physical Therapy, School of Auxiliary Medical Services, University of Pennsylvania, Philadelphia;

Alice Busch, Supervisor, Out-Patient Clinic, Kaiser Foundation Hospital, Vallejo;

Marjorie Ionta, Supervisor of Physical Therapy, Massachusetts General Hospital, Boston;

Sarah E. Gruss, Head Physical Therapist, St. John's Hospital, St. Paul;

Elvera Guebert, Student, Short Term Course, California Rehabilitation Center, Vallejo;

David Merry, Bremerton, Washington;

Ed Rathjen, Self employed, San Jose, California;

Diane Toussaint, Supervisor of Gymnasium, California Rehabilitation Center, Vallejo.

Technics as taught by Margaret Rood, Professor, Department of Physical Therapy, University of Southern California will be demonstrated by:

Elizabeth M. Barnett, Candidate for Master's Degree, Department of Physical Therapy, University of Southern California;

Margaret Bryce, Graduate Student, University of Southern California;

Margaret Camp, Student, Short Term Course, California Rehabilitation Center, Vallejo;

Carol Bankson, Coordinator of Cerebral Palsy Program, Home for Crippled Children, Pittsburgh;

Elizabeth Fellows, Graduate Student, University of Southern California;

Vera Ford, Assistant Director, Department of Physical Therapy, Los Angeles Orthopaedic Hospital;

Eleanor H. Hansen, Supervisor, Physical Therapy Department, Hospital of the Good Samaritan, Los Angeles;

Carol Moyer, Director of Physical Therapy and Coordinator of Therapies, Wyoming Valley Crippled Children's Association, Wilkes-Barre, Pennsylvania.

School Physical Therapists' Luncheon in Seattle

Physical therapists who are employed in schools for the physically handicapped are invited to express their interest in a get-together during the 35th Annual Conference in Seattle. Any other members of the Association who may be interested are welcome.

Address correspondence to:
Laura M. Burkholder, Box 1003, Bartow, Florida

Conference Speakers

William R. Duncan, M.D., is Senior Consultant, Division of Orthopaedic Surgery, University of Washington Medical School; Director, Cerebral Palsy Service, Children's Orthopedic Hospital, Seattle; Cerebral Palsy Consultant, Washington State Department of Health, Crippled Children's Division; and serves as orthopedic consultant to several schools and treatment centers for the cerebral palsied in the Seattle area. Dr. Duncan, a graduate of the University of Washington, studied medicine at McGill University Medical School. After serving internships in Montreal hospitals, he held a residency appointment at the Hospital for Special Surgery, New York City, and was a Fellow in Anatomy and Pathology at Columbia University Medical School. He also served as orthopedic resident at Presbyterian Hospital, New York. Among Dr. Duncan's publications, "The Significance of Primitive Reflexes in Spastic Paralysis," published by Dr. Duncan and others in the *Proceedings of the Western Orthopedic Association*, November 1956, is most closely related to the theme of the Conference Program. On Thursday morning, June 19, Dr. Duncan will participate in the panel discussion, Testing and Measurement—Purposes and Methods. Reflex Mechanisms in Human Gait, a film produced by Dr. Duncan, will be presented at the Film Theater during the week of Conference.

Ellen H. Waters, Assistant Professor, Department of Physical and Health Education, University of Washington, teaches adapted physical education and health education. Miss Waters, a graduate of the University of Washington, received the master of arts degree from Teachers College, Columbia University and the certificate in physical therapy from Stanford University. In her present position Miss Waters serves as faculty advisor to students preparing to study physical therapy. Miss Waters has maintained her interest and skills in physical therapy through clinical work during the summer vacation periods. She has had a varied experience in physical and health education in the public schools, has participated on many committees, and has conducted workshops related to these subjects. She has had for many years an interest in physical health and will present, "Physical Fitness: What Are We Finding?" during the closing session of the Conference program.

Ruth Cook, Coordinator of Education and Research, May T. Morrison Center for Rehabilitation, San Francisco, received the certificate in physical therapy from D. T. Watson School of Physiatrics. Miss Cook later was awarded the bachelor of arts and master of arts degrees at Stanford University. She served as a physical therapist with the United States Army from 1941-1945. Miss Cook will present a problem for Dr.

Ripley's discussion during the Thursday afternoon session on "Understanding the Patient's Emotional Reactions to Disability and Treatment."

participant on the panel discussion, Testing and Measurements—Purposes and Methods, to be held on Thursday morning, June 19.

Sherburne W. Heath, Jr., M.D., is Director in Physical Medicine and Rehabilitation, Children's Orthopedic Hospital, and also practices privately in Seattle, Washington. After graduation from Whitman College, Walla Walla, Washington, Dr. Heath received the doctor of medicine degree from Marquette University School of Medicine in 1945. He studied at the Mayo Foundation and University of Minnesota from 1950-1951. Dr. Heath is a member of the American Academy of Physical Medicine and Rehabilitation and the American Congress of Physical Medicine and Rehabilitation. During the 35th Annual Conference he will participate in the panel discussion on Testing and Measurement—Purposes and Methods.

Helen Vaughn, Coordinator of Physical and Occupational Therapy, District of Columbia Bureau of Maternal and Child Health, is a graduate of Oberlin College and received the certificate in physical therapy at Mayo Clinic. Prior to assuming her present position, Miss Vaughn was for many years the Technical Director of the Department of Physical Medicine, Georgia Warm Springs Foundation. Miss Vaughn will be a

Martin O. Mundale, Head Rehabilitation Therapist, Elizabeth Kenny Institute, Minneapolis, is a graduate of St. Olaf College, Northfield,

Minnesota. Mr. Mundale received the bachelor of science degree from the University of Minnesota where he studied physical therapy. His previous physical therapy positions include those of staff physical therapist at the University of Minnesota and Instructor, Course in Physical Therapy, University of Minnesota. Mr. Mundale will present a problem for Dr. Ripley's discussion during the Thursday afternoon session on "Understanding the Patient's Emotional Reactions to Disability and Treatment."

Dorothy J. Peterson, Captain, Army Medical Specialist Corps, is a staff physical therapist stationed at Madigan Army Hospital, Tacoma, Washington. Captain Peterson attended the University of Wisconsin, obtained her physical therapy certificate at Children's Hospital School of Physical Therapy, Los Angeles and was awarded her bachelor of arts degree from New York University. She served in the Army from 1944 to 1947 and from 1951 to the present. Following the completion of her baccalaureate degree she served as a staff physical therapist at New York University-Bellevue Institute for Physical Medicine and Rehabilitation. During her present Army tour she served in Army hospitals in Japan and Okinawa, and at Walter Reed, Brooke and Madigan Army Hospitals.

Captain Peterson will act as military chairman for the Military Physical Therapy Symposium during Conference.

On Thursday morning, June 19, she will participate in the panel discussion on Testing and Measurement—Purposes and Methods, relating her discussion to functional activities and electrical tests.

Public Health Section

Vice Chairman
PATRICIA ADAMS

CLARA ARRINGTON, *Chairman*
Treasurer—WILHELMINA WERKHOVEN

Secretary
ANNA SWEELEY

Sunday, June 15

8:45 A.M. — 5:00 P.M.	**Colonial Room**
8:45 A.M.	Registration for Public Health Section Meeting
9:15 A.M.	*Panel*
	Carolyn Bowen, Moderator
	William King, Manager, Mobile Therapy Unit Program, to discuss the "Development, Organization, and Administration of Elks Mobile Therapy Program."
	Erma C. Myers, to discuss "The Program and Our Relation to Other Agencies Providing Services."
	Lois Radomske, to discuss "Equipment—Standard and Improvised."
	Elks Mobile Therapy Unit Program Moving Picture Film in color.
	General discussion of the program to provide listeners an opportunity to ask questions, etc.
10:30 A.M.	Intermission
10:45 A.M.	General Discussion
1:30 P.M.	*Panel*
	Philip A. Austin, Head, Hospital and Nursing Home Section
	Carolyn Bowen, Physical Therapy Consultant, Maternal and Child Health and Crippled Children's Services Section, Division of Child Health Services
	Elizabeth Tucker, Nursing Home Consultant, Hospital and Nursing Home Section
	Evelyn Bengson, Occupational Therapist, Hospital and Nursing Home Section
	Vera H. McCord, Hospital Services Consultant, Hospital and Nursing Home Section
3:00 P.M.	Intermission
3:15 P.M.	Discussion
4:30 P.M.	Business Meeting

Conference Exhibitors

Technical Exhibits

BAILEY MANUFACTURING CO.
Lodi, Ohio

The Bailey Manufacturing Company will feature redesigned "Treatment Tested" therapeutic rehabilitation equipment. Pilot models have been in use in treatment centers and the results of these tests have been incorporated in Bailey products. For the first time the physical therapist is offered "Treatment Tested" equipment with the largest possible range of utility.

BOOKS OF ALL PUBLISHERS

There will be a "Books of All Publishers" exhibit. The following books will be on display: Daniels, et al: *Muscle Testing;* Hollinshead: *Functional Anatomy of the Limbs and Back;* Karpovich: *Physiology of Muscular Activity;* Lowman and Roen: *Therapeutic Use of Pools and Tanks;* Rathbone: *Corrective Physical Education*—Ed. 5; Wells: *Kinesiology*—Ed. 2; Williams and Worthingham: *Therapeutic Exercise;* Knott and Voss: *Proprioceptive Neuromuscular Facilitation.*

BRISTOL-MYERS PRODUCTS DIVISION
New York, New York

AMMENS Medicated Powder, a finely milled dispersion of talc in highly absorbent starch granules, is an ideal powder for patient protection and comfort under casts, braces, and suction prostheses, and for dry massage. BUFFERIN, well tolerated antacid-analgesic, and MINIT-RUB, a greaseless, stainless analgesic and rubefacient, will also be on hand.

THE BURDICK CORPORATION
Milton, Wisconsin

The Burdick Corporation will exhibit their line of modern Physical Therapy Equipment, including conventional and microwave diathermy, ultrasonic equipment, and muscle stimulating apparatus. You are particularly invited to inspect and test the new MS-300 electrical stimulator.

S. H. CAMP AND COMPANY
Jackson, Michigan

See the newly designed Supports and Appliances by CAMP. A new cervical collar offers comfortable support and is adjustable both for flexion and extension. Camp products are designed to achieve better function. Patients appreciate the comfort, quality, and low cost. A cordial invitation is extended to see latest developments.

CHATTANOOGA PHARMACAL CO., INC.
Chattanooga, Tennessee

Welcome to the HYDROCOLLATOR booth for a demonstration. Each application gives at least 30 minutes effective MOIST HEAT. Ideal for back cases, necks, arthritics. Aids in conjunction with cervical traction. Four models of Master Units display automatic, thermostatically controlled heaters which maintain a constant supply of ready-to-use Steam Packs.

THE COCA-COLA COMPANY

Ice-cold Coca-Cola served through the courtesy and cooperation of the Coca-Cola Bottling, Inc., Seattle, Washington and The Coca-Cola Company.

ELGIN EXERCISE APPLIANCE COMPANY
Elgin, Illinois

You are cordially invited to inspect the ELGIN EXERCISE UNIT, and other EXERCISE UNITS. Specifically designed and developed scientifically to meet the varied problems of remedial exercise therapy. Simple functional exercises to the most highly definitive focal exercises may be performed with this equipment with surgical and non-surgical patients.

EVEREST & JENNINGS, INC.
Los Angeles, California

Be sure to see the Everest & Jennings Elevating Seat. Hydraulically operated, this new attachment can be easily operated by the patient and has a 9 inch range of elevation.

FREEMAN MANUFACTURING COMPANY
Sturgis, Michigan

The Freeman line of surgical supports emphasizes orthopedic braces for conservative measures. Rigid control and almost complete immobilization of the sacral, lumbar, and thoracic area is achieved through use of splint type construction in combination with block and tackle effect of straps and buckles. Special designs and constructions are available for any purpose.

GREAT BOOKS OF THE WESTERN WORLD
Seattle, Washington

There are 102 GREAT IDEAS briefed for you in the 102 essays of the SYNTOPICON, which opens the door for you to the thinking of the greatest minds of the Western World on any subject you choose. Our public information staff will be on hand for your requests.

GUARDIAN PRODUCTS COMPANY, INC.
Los Angeles, California

GUARDIAN PRODUCTS COMPANY of Los Angeles exhibits their line of SAFE-T-GRIP Crutch Tips, Crutch Accessories, Crutches, Canes, Foam Rubber Invalid Rings and Cushions, and other products for the safety and comfort of the invalid.

W. R. HAUSMANN WOODWORK, INC.
New York, New York

Featuring the only Stand-in Table built for the use of adults. An exclusive Hausmann Design. This table

provides an unusually large tabletop area which enables the patient to simultaneously derive therapeutic and reactional benefits. A visit to our booth will enable you to see a full demonstration of its many uses.

JACUZZI BROS., INC.
Berkeley, Calif.

The Jacuzzi Whirlpool Bath is a lightweight, portable unit which sits in the bathtub. Whirlpool therapy helps increase circulation, reduces muscle spasm and pain, improves tissue oxidation. Whirlpool hydromassage is easily available at low cost for use in hospitals and clinics and for patients under doctors' care in the home.

LA BERNE MANUFACTURING CO., INC.
Columbia, South Carolina

A new Portable Progressive Resistance and Assistive Exerciser that conditions musculature, aids joint motion and circulation. It permits knee and hip flexion, pelvic stabilization and exercises of trunk muscles. All exercises possible with chest pulley weights and many exercises not previously available in conditioning upper extremities may be performed.

R. J. LINDQUIST CO.
Los Angeles, California

CHRONOSONIC ULTRASOUND INSTRUMENTS will be featured. See the new multiple-crystal soundheads used in stationary ultrasound application. It is not necessary to keep the soundhead in motion during treatment. Constant attention is not required. Colors are available in the new console equipment, the Lindquist Short Wave Diathermy, the Chronowave muscle stimulator, and traction equipment. Reprints available.

MEDCO PRODUCTS CO.
Tulsa, Oklahoma

Presenting the MEDCO-SONLATOR. Providing a new concept in therapy by combining muscle stimulation and ultrasound simultaneously through a Single Three-Way Sound Applicator. The MEDCO-SONLATOR is a distinct advance in the effectiveness of physical therapy. A few minutes spent in our booth should prove of value to you.

MILES REPRODUCER COMPANY
New York, New York

Walkie-Record-all, Briefcase Conference Recorder records clearly in noisy places at a 60 foot radius and operates in or out of the closed briefcase. The Voice-Activated "Self-Start-Stop" eliminates supervision and recording of silent periods. Up to 8 hours of recording on a belt costing 25 cents.

N-K PRODUCTS COMPANY
Santa Cruz, California

The NK line of exercise equipment is designed with time in mind. The uncomplicated ease of operation of the NK Unit has resulted in acceptance by hospitals, clinics, and rehabilitation centers throughout the United States. See how easy P.R.E. can be. See the NK Exercise Unit.

PHYSICAL MEDICINE PRODUCTS CO.
Kansas City, Missouri

Stop, look, and see demonstrated the four new models of the PAUST Neuro-Muscle Stimulators. See too, the miniature Sonowave Ultra-Sound—all precision instruments—all unconditionally guaranteed.

PORTO-LIFT MANUFACTURING COMPANY
Lansing, Michigan

The original producer of invalid lifting equipment, PORTO-LIFT Manufacturing Company pioneered the development of bed patient transfer facilities. The sturdily constructed PORTO-LIFT is completely mobile, utilizing easy-to-operate hydraulic action that eliminates physical strain on attendant—ensures smooth and comfortable patient transfer from bed to wheel chair, conventional chair, automobile and bath.

J. A. PRESTON CORPORATION
New York, New York

Welcome to our many friends. You will see an All-New Walker, two unique Plastic Goniometers, the popular N-K Exercise Unit, selected books, and many other products. PRESTON—Originators of A Complete Line for Physical Therapy. The PRESTON CATALOG is your most complete ordering source for all your needs.

REHABILITATION PRODUCTS, DIVISION OF AMERICAN HOSPITAL SUPPLY CORPORATION
Evanston, Illinois

Selected products of diagnostic, physical therapy and rehabilitation equipment: The new TOMAC PLASTIC GONIOMETER; miller TWISTER; TOMAC "ANKLE-ACTION" TRIPOD CANE; holding mitt; invalid walkers; American Wheel Chairs; bathroom safety rails; exercise equipment and self-help devices. The Rehabilitation Products staff calls regularly on all hospitals and rehabilitation facilities.

SPENCER, INC.
New Haven, Connecticut

Every Spencer Support is individually designed according to prescription needs to assist in corrective and rehabilitative treatment. You are cordially invited to see these supports or inquire about specific requirements of patients. Ask about the Spencer Emergency Service, which your Spencer Corsetiere can give to those patients requiring immediate support.

TECA CORPORATION
White Plains, New York

See Teca for the latest in electrodiagnosis and electrotherapy. Low volt generators, chronaxie meters and the Teca electromyograph with new photo recording and conduction time testing features will be in operation. Bring your questions.

TRU-EZE MFG. CO., INC.
Burbank, California

EXTRA HANDS for YOU!! See the versatile TRACTOMATIC, portable intermittent traction machine. Simple operating technic permits simultaneous treatment of other patients. Cool running, rugged construction, precision built, economically priced with 100 lbs. of traction pull. Smooth, gentle, and firm vertical or horizontal traction provided from any angle, height or position.

Scientific Exhibits

THE ARTHRITIS AND RHEUMATISM FOUNDATION
New York, New York

"Services of the Arthritis and Rheumatism Foundation." The exhibit provides graphic details of the Foundation's chief program activities; treatment facilities, home care, research and training, and special projects.

CHILDREN'S REHABILITATION INSTITUTE, INC.
Reisterstown, Maryland

"Children's Rehabilitation Institute, Inc. for Cerebral Palsy." Views of the inpatient and outpatient program at C.R.I., education, therapies, pediatric care, and professional training of doctors and therapists.

HIGHLAND VIEW HOSPITAL
Cleveland, Ohio

"Home for Living." The exhibit presents in compact form scale models of kitchen, dining room, living room, bedroom, bath and utility rooms in combination with pictures of specific details of changes most often recommended to transform the home to safe and more adequate living.

THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS
New York, New York

"Respiratory and Rehabilitation Centers in the United States." The exhibit outlines pictorially the varied and extensive activities included in the three-fold program of Research, Teaching, and Patient Care carried on in the fifteen Respiratory and Rehabilitation Centers in the United States supported by the National Foundation for Infantile Paralysis.

UNITED STATES AIR FORCE MEDICAL SERVICE
Maxwell Air Force Base, Alabama

"Progressive Splinting—Traumatic Hand Injuries." The exhibit will show cases of progressive splinting of traumatic hand injuries and splints made at Maxwell Air Force Base.

VETERANS ADMINISTRATION HOSPITAL
Phoenix, Arizona

"Conditions and Deformities of Rheumatoid Arthritis." The exhibit shows by means of transparencies and X rays, deformities caused by rheumatoid arthritis and acute rheumatoid joint.

Chapter Exhibits

ILLINOIS CHAPTER

Shows procedure followed in setting up: (1) An Annual Chapter Directory; (2) A State Wide Physical Therapy Services Survey. The Directory is available to Doctors, Agencies, Hospitals and APTA members. The Survey is an outgrowth of emergency work done in 1956 to locate physical therapy services available for polio work.

NORTHERN CALIFORNIA CHAPTER

"Your Chapter Serves You." This exhibit is designed to graphically illustrate some of the many ways in which a local chapter organization serves its members. It is hoped that this exhibit will help bring into sharp focus the purpose and function of local chapters.

Calling All Charter Members

Washington State Chapter has an enthusiastic nucleus of Charter Members of the APTA who look forward to meeting again with all other Charter Members during the 35th Annual Conference in Seattle, June 15-20. In January, 1957, the Washington State Chapter honored Elsie Child, Emily Griffin, Marguerite Irvine, and Karen Rynning. (See May 1957 issue of the *Review*, page 312.) These four members will be in Seattle to greet their old friends and many of our newer members will be on hand to meet those who founded our Association.

Plan to come and when you arrive be sure to sign up as a Charter Member. You will have all week to be together and it is planned to reserve special tables at the Annual Banquet on Tuesday evening in recognition of Charter Members who attend this Conference.

Alumni Meetings at Conference

Monday, June 16

University of Pennsylvania Alumni Punch Party—4:30 to 6:30

Wednesday, June 18

Columbia University Alumni Reunion Luncheon—Noon

University of Wisconsin Alumni Luncheon—Noon

Let's Explore

Chief Seattle's Territory

Welcome to Seattle—largest city of its age in the world. From vantage points on its seven hills, your host chapter looks over a city that began as a settlement of five families in 1851, and was called "New York Alki" (Indian for "New York bye and bye"). All the ingredients for making a happy, successful conference week are at hand. Out of the roar of the Boeing Jet aircraft overhead and the thunder of the traffic below, we are reminded of Chief Seattle's last words before he and his tribes were banished to the reservation:

> . . . "And when the last Red Man shall have perished, and the memory of my tribe shall have become a myth among the White Men, these shores will swarm with the invisible dead of my tribe and when your children's children think themselves alone in the field, the store, the shop, upon the highway, or in the silence of the pathless woods, they will not be alone. . . . At night when the streets of your cities and villages are silent and you think them deserted, they will throng with the returning hosts that once filled and still love this beautiful land. The White Man will never be alone. . . ."

Yes, the city is beautiful. At nights its myriads of lights reflect in the waters, and even in the somberness of rainy weather when waters of the bay are slate grey and low clouds scud across the sky, it does not lose its charm. Thus guarded by the spirits of our departed hosts, you will enjoy the tradition of Seattle as well as your week of "pow wow."

You will discover the Olympic Hotel, your conference headquarters, located in the metropolitan center, which consists of nine acres (or four blocks) of buildings. This valuable tract is a holdover from the state's first, very early, adventure in education. Here, in 1861, stood a quaint structure called the Territorial University, long since disappeared. The University of Washington is the sole owner of this tract with all its improvements.

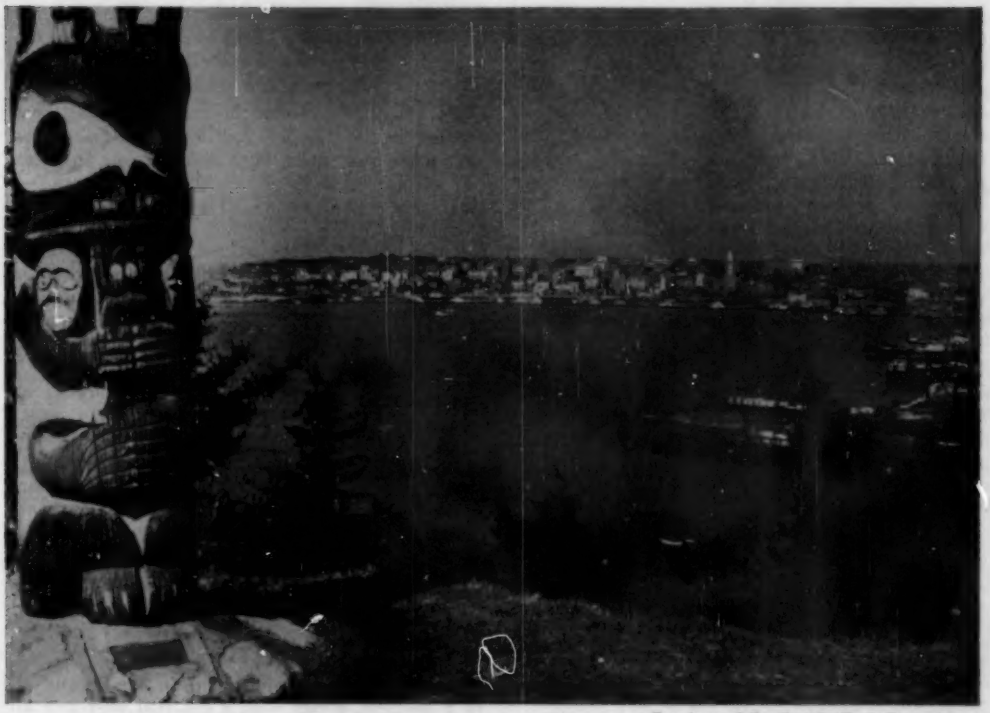
Seattle is a city of steep descents and sudden turns, with streets that fall away inevitably to the waterside with docks and moored ships of every description. Seattle is one of the most important export cities in the United States. Since it is known as the "Gateway to Alaska and the Orient" (although this is a figurative use of the word "gate"), you should take a swing on it and get a close-up view of the enchanting world into which it opens. With your camera stroll to the waterfront and visit one of the fish markets where every day from the nearby sea there is seafood of any variety your palate savors. Probably our most delectable seafood specialty is the Dungeness Crab. It is larger than a lobster, very meaty and tender, and has a subtle, delicate flavor.

In this vicinity also is "Ye Olde Curiosity Shop" at Colman Ferry Dock. Browse through this rich collection of curios from all parts of the world. You'll find that the waterfront preserves the past of Seattle in many places.

Pioneer Square in the shadow of the 42 story Smith Tower Building marks almost the exact spot where the city began to grow a century ago. Here stood Yesler's Steam Mill that first brought workers, settlers, and business men to the little town on Elliott Bay. A few blocks south are the Union and King Street stations, western terminals of four transcontinental railroads. You must also stroll through "skid road," that descriptive tag from old days of logging, and browse through an "Alaska Outfitters" establishment, remnant of the Alaska Gold Rush days. What you see may be a junk shop to you, but it is a bargain mecca to workers and drifters who still give a Jack London flavor to this end of the city. At nightfall, listen to the street-corner forum, settling the problems of world economy or offering salvation to fallen souls.

Broad Alaska Way is a long sweep of activity which subsides but does not entirely cease during the early rush of the morning. Locomotives noisily shunt their cars and trucks rumble along the wide dock-lined street. Stevedores expertly load and unload slings swung by booms and squeaking winches. Tug boats whistle petulantly and ferries push their way in and out of the slips. Occasionally an airplane drones overhead and swoops down to a landing on the waters of Elliott Bay. From unostentatious docks, and from piers longer than in any other country, vessels depart for Alaska and the Orient. And the seagulls drift over the entire city, coming to rest everywhere, even on cornices and spires of churches.

Seattle is a city of many races and nationalities. Scandinavians and Finns were attracted by lumbering and fishing; Irish, Italians, and peoples of the Balkan Peninsula found employment in construction and railroads; Germans, English, and French in various service trades, the food industry, and professions. Among the early arrivals were also Chinese, Japanese, Filipinos, Hawaiians, and Negroes.



Courtesy of the Seattle Park Department

Belvedere Park, West Seattle

Seattle is a city of homeowners with 70 per cent of its dwellings owner-occupied. View property is everywhere thanks to Seattle's rolling hills, and Seattleites take pride in their gardens and yards. Most striking in June are the numerous rock gardens in full bloom. When driving on Seattle's boulevards you find yourself in a scenic environment, often passing through beautifully wooded districts where at many spots a wide view opens, revealing lakes and mountains in their various moods. There are several panoramic vistas that you can't afford to miss. On the fresh water side of Seattle, for example, is Boston Terrace where many beautiful homes are scattered on hillside terraces. Here is a vantage point which offers a view of Portage Bay and its two yacht clubs, and rows of houseboats tied to piers, many are bright with flower boxes. Directly beyond Portage Bay we get an air perspective of the grounds of the University of Washington Campus. It covers 600 acres and has an enrollment of 15,000 students. The University's Tudor-Gothic architecture presents a striking contrast to a background of woods. The stadium houses 55,000 football fans. Off the campus, but nearby, the University's Arboretum occupies a 260 acre tract, where the stunning rhododendron, azalea and dogwood of the Northwest flourish in company with exotic plants from all over the world.

On the salt water side of Seattle is Magnolia Boulevard, bordered not with magnolias as the pioneers first thought, but with madroña trees. Following a curved rim high above the shores of Puget Sound, this boulevard affords a thrilling view of the Olympic Mountain Range and Elliott Bay, dotted with ships and ferries.

Following the contours of the Sound we come to Ballard Bridge which brings another invigorating sight—Salmon Bay, home of the fishing fleet. To the east of this bridge you will see the log booms and a plywood plant. From here you come to the waterway connecting with Lake Washington. The Lake Washington Ship Canal is a vital link that opened two land-locked fresh water lakes, Lake Union and Lake Washington,

and joined them with the salt water of the Pacific Ocean. These government locks which are exceeded only by the Panama Canal in ship handling capacity, can raise a row boat or a 780-footer from Sound level to that of the lakes, or lower it upon its return in a few minutes. One hour at the Locks spent watching the endless parade of pleasure craft on a weekend or holiday is truly a thrill and reveals that Seattle is a city of boat-owners. Known as the "boating capital of the world," the area furnishes many miles of fresh and salt water for the enjoyment of the small boat owner who doesn't have to be a millionaire to enjoy the delights of his pleasure boat, and who finds relief from the crowded highways by taking to the water on weekends. The Ship Canal, slicing through mid-Seattle and terminating at the Locks, is the path to a true boating paradise. Sailing regattas and races for all types of boats are enjoyed by skippers and audiences throughout spring and summer.

Seattle is a city of cultural and recreational interests. Though their first allegiance is to the challenge of outdoors, most Seattleites appreciate the city's dedication to the arts. The Seattle Symphony itself is a financial success and a source of civic pride, bringing the best in music to its audiences. Under the direction since 1954 of Milton Katims, a Toscanini protege, and an internationally known cellist, it has flourished against the most unpromising conditions. There are many fine art exhibitions and museums too, including the Seattle Art Museum in Volunteer Park, noted for its famous collection of Chinese jade; the Henry Art Gallery and the Washington State Museum on the University of Washington Campus; the Museum of History and Industry; and the Frye Art Museum. Amateur theatricals flourish in Seattle. The University's Penthouse and Showboat Theatres provide opportunity for professional training as well as contributing to the excellent entertainment offered by Seattle's legitimate theatres.

Seattle's recreational interests find outlet through many sources. There are 48 parks and over 70 special park areas. There are three municipally operated golf courses and golf is a year 'round sport in Seattle. Lincoln Park's warm water outdoor pool and Green Lake's fresh water indoor pool are two of Seattle's many attractions for swimmers. Out of 10 public bathing beaches, 3 are on salt water and 7 on fresh. Tennis courts, bowling greens, horseshoe courts, ball fields, archery ranges, hiking, and bicycle trails are all part of Seattle's Park System. Woodland Park composed of 188 acres is the home of Seattle's Zoological Garden. The collection of over 2,000 animals and birds is delightful. It also has a beautiful rose garden, baseball diamonds, tennis courts, playgrounds, and picnic tables.

For the baseball and horseracing fans, there are the Seattle Rainiers ball team and Longacres race track at Renton, both going strong in June. "From Sea level to Ski level in two hours,"—skiers have their choice of mountains or water for skiing.

Nature has been kind to Seattle, endowing it with a healthful, invigorating climate. And Seattle has worked hard to safeguard this priceless heritage against the hazards of rapid growth and increased population. A combined County-City Health Department wages the battle of disease prevention, pioneering in many fields. Seattle is served by 30 hospitals, including a United States Public Health Service Hospital, a Veterans Administration Hospital, the King County Hospital System, and a 200 bed Children's Orthopedic Hospital. The University of Washington has a Medical and Dental School with a hospital soon to be completed. A long awaited School of Physical and Occupational Therapy will also open soon. There are five schools of nursing associated with the University, Seattle University, and St. Frances Xavier Cabrini Memorial.

A city of over one-half million has sprung up in a lifetime, a city with a colorful past and an exciting future. You needn't go far to glimpse a mountain or to see the water, but if you wish to see it in its proper perspective rising majestically from its amphitheatre of hills between the mountains and the sea, go to Belvedere Place at Admiral Way in West Seattle near the spot that was called "New York Alki." Think of the words of Chief Seattle and you will remember the 35th Annual Conference and Seattle:

> "I will be with you.
> When White men come from North, South
> East, West to potlatch on ancient
> pow-wow grounds, I See-attle
> Will be with you."

Reserve Officers of the Army Can Earn Credit in Seattle

The Commanding General, U.S. Continental Army Command, has approved the awarding of retirement point credits for Army Reserve Officers who attend specified sessions of the American Physical Therapy Association Conference in Seattle in June.

Provision will be made for Reservists to reg-

ister in the Spanish Lounge of the Olympic Hotel as required.

Military Physical Therapy Symposium of The American Physical Therapy Association
Olympic Hotel, Seattle, Washington
15—20 June 1958
Military Chairman—
Capt. Dorothy Peterson, AMSC

The following sessions, by virtue of their military educational value, are included in the symposium and are authorized as military training assemblies. Reserve officers of the Army are therefore eligible to earn training and retirement point credits for attendance at the sessions indicated below providing such attendance at any session is for a period of not less than 2 hours and registration at each session is accomplished with the individual designated by the Commanding General to accomplish such registration. Not more than one credit can be granted for any single calendar day.

PROGRAM SESSIONS

Day Date Time

Monday, 16 June 1400
Neurophysiology a Physical Therapist Should Know (Ernst Fischer, M.D., Research Professor of Physiology, Medical College of Virginia)

Tuesday, 17 June 1430
Pathological Factors Which Limit Purposeful Movement
(Lawrence Knopp, M.D., Instructor in Neurosurgery, University of Washington School of Medicine) Panel Discussion

Wednesday, 18 June 1430
Lecture Demonstrations on Principles of Treatment and the Responses of the Patient

Thursday, 19 June 0900
Analysis of Motor Dysfunction and Planning for the Patient; Testing and Measurement; Purposes and Methods

Friday, 20 June 1400
Concurrent Sessions:
Ultrasound; Torque in Range of Motion; Myofascial Pain; Physical Fitness

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Self Employed Section

Vice Chairman
JAMES B. MCKILLIP, JR.

ROBERT G. DICUS, *Chairman*

Corresponding Secretary
THOMAS WELCH

Treasurer
BERTRAM L. GUSTAFSON

Recording Secretary
CARMEL HYBARGER

Sunday, June 15

Pacific Evergreen Room

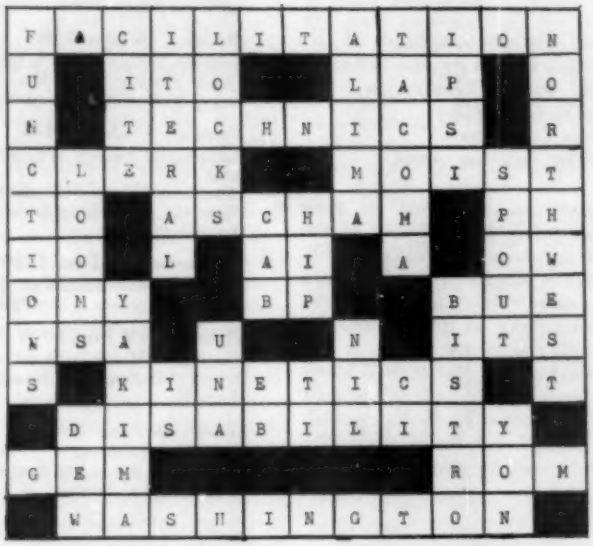
8:00 A.M.	Executive Committee Breakfast
8:30 — 9:30 A.M.	Registration in Rex Room
9:00 A.M.	Meeting called to Order — Welcome — Introduction of Section Officers and APTA Officers in attendance — James B. McKillip, Jr., Program Chairman
9:15 A.M.	History of the Section — Robert G. Dicus
9:30 A.M.	Why Self Employment — Robert Teckemeyer
9:45 A.M.	Your Professional Organization and Ethics — Kathryn S. Bier
10:00 A.M.	Questions directed to the first three speakers.
10:15 A.M.	Announcements — Nominations for Officers from the floor — Charles Magistro
10:30 A.M.	Choosing your Location — Alma Maga
10:45 A.M.	Medical Records — Joseph Breuer
11:00 A.M.	The Economics of Self Employment — Harold Feldman
11:15 A.M.	Questions directed to the last three speakers.
11:30 A.M.	Open Discussion
12:15 P.M.	Luncheon — Olympic Bowl
2:00 — 4:00 P.M.	Business Meeting — Rex Room

Monday, June 16 Meeting of the new Executive Committee and other committees

Tuesday, June 17

12:00 Noon Luncheon, if desired

Your Conference Crossword Puzzle


F A C I L I T A T I O N
U I T O L A P O
N T E C H N I C S R
C L E R K M O I S T
T O A S C H A M P H
I O L A I A O W
O M Y B P B U E
N S A U N I T S
S K I N E T I C S T
D I S A B I L I T Y
G E M R O M
W A S H I N G T O N

This puzzle appeared in the May *Review* on page 359.

Self Employed Section

All applications for membership in the Self Employed Section must be approved no later than the start of the business meeting in Seattle, Washington, June 15, 1958. This means that they must be in the hands of the corresponding secretary,

Thomas Welch
837 Fifth Street
Santa Rosa, Calif.

No later than 12:00 noon, June 15, 1958.

All Association members are cordially invited to attend the morning and afternoon session of the Self Employed Section meeting. If luncheon is desired, reservations must be made in advance with the treasurer, Bert Gustafson, 609 Sutter Street, San Francisco, or at the Self Employed Section Registration desk on the basis of first come, first served. Although the business meeting will be open to the general membership, participation will be limited to members of the Section.

Potlatch—Totem Talk—Apples

The Chinook Indians had a word for feasting and gift giving—potlatch—so the Washington State Chapter greets you and gives you the Explorers' Potlatch on Sunday from 5:00 P.M. to 8:00 P.M.

Totem Talk, the Conference daily paper, could be "tall talk" but will give you the news and the latest word on Conference activities.

You have all enjoyed Washington State's delicious apples but for your first in Washington State your hosts have arranged for an "Apple Break" at the close of the Opening Session on Monday.

Washington State Chapter gives, you come, you get!

Dues Notice

Annual dues were payable on May 1st. Your prompt response will be appreciated as a service to the Association and to insure your uninterrupted receipt of the *Physical Therapy Review* along with other membership privileges. Those who are not actively practicing physical therapy may apply for inactive membership.

Student Column

A Pledge Upon Graduation

Today, I am a physical therapist and a proud profession welcomes me. Today, I have completed the first step toward becoming a professional person.

On a tomorrow soon, I shall begin to grow through service. I shall serve the patients whom the medical profession entrusts to me with the best application of my knowledge and skills. I shall remember that every patient is a person who has many needs which are intensified because he is a patient.

I shall learn from my patients and my contact with the medical profession, and I shall realize with humility that my own potentialities are not fully developed. I will strive to retain an attitude of learning, an open and inquiring mind, and a healthy body and mind that I may better serve my patients and my profession.

I will bind myself together with my physical therapist colleagues that we may share together our experiences. I will work with them in all ways that will better my chosen profession, physical therapy.

—Dorothy E. Voss

Hermann School of Physical Therapy

"During the Texas State Convention of the APTA, held in Houston, April 18, 19 and 20, the student class of the Hermann School of Physical Therapy, Hermann Hospital, raised money for the APTA research fund. This was accomplished by selling chances on two pocket goniometers which were donated by the J. A. Preston Corporation.

"After the sales were completed, a total of $52.55 had been cleared and a check is herein enclosed for that amount. Our entire class really feels this is a worthwhile cause and were happy to have a part in helping."

George A. Gage
Class Chairman

University of Southern California

A most unique experience confronted the Physical Therapy Department at U.S.C. in "sunny California" this spring. During an unusually prolonged period of "liquid sunshine" the campus walks were turned into small rivers and much of the campus was flooded. The physical therapy students were in hydrotherapy class when the waters reached their peak. Only when the rising waters entered the classroom . . . and it was ascertained not to be an unusual overflow from the whirlpools was class discontinued. It must be reported, however, that the real sun was shining before the end of the day in true California fashion, and that sun-bathing replaced the liquid variety.

Sandy Paris

University of California

Medicine is one of the most interesting courses for students at the University of California. Each week for the entire school year the class meets for lecture, demonstration, and seminar discussions. Emphasis is placed on the place of the physical therapist in the treatment or prevention of the many pathological conditions considered. Further, the course serves to correlate anatomy, physiology, pathology, and physical therapy procedures.

Actual patients are used for instruction. For example, when respiratory diseases were the topic, a patient with emphysema was brought into class. A simple pulmonary function test was performed and results compared with a similar test on a normal person. Equipment and procedures used in the treatment of emphysema were demonstrated including intermittent positive pressure breathing and exsufflation with negative pressure.

Seminar discussion of an exercise program for the emphysema patient followed the presentation of the case.

Louise Lokey

Don't Fail . . . . .

To notify the *Review* when you leave school for clinical practice, go home for a vacation, or take a new position.

If you have not decided upon your new location, write and ask that your *Reviews* be held until you can furnish an exact address—which includes *postal zone number!*

***Physical Therapy Review*, 1790 Broadway, New York 19, N. Y.**

Physical Therapy Programs

APPROVED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Schools offering the four year program leading to a baccalaureate degree accept high school graduates and transfer students. Schools offering the 12 to 16 months' program leading to a certificate accept students who have completed all or most of their undergraduate work providing they meet certain course requirements. Recipients of a degree and/or certificate have equal professional status. For specific information regarding each school's entrance requirements, curriculum, tuition and other fees, write to the physical therapy director indicated below. All students should investigate course requirements *early*.

	Degree	*Certificate*
CALIFORNIA		
Mary J. Dodge School of Physical Therapy Childrens Hospital Society 4614 Sunset Boulevard Los Angeles 27	‡	†
Ronald A. Hershey School of Physical Therapy College of Medical Evangelists Loma Linda	†	†
Lucille Daniels Division of Physical Therapy Stanford University Stanford (Palo Alto)	†	†
Margery L. Wagner Curriculum in Physical Therapy University of California The Medical Center San Francisco 22	†	†
Charlotte W. Anderson Department of Physical Therapy University of Southern California Los Angeles 7	†	†
COLORADO		
Dorothy Hoag Curriculum in Physical Therapy University of Colorado Medical School Denver 20	†	†
CONNECTICUT		
James M. Bauer Acting Director School of Physical Therapy U 101 University of Connecticut Storrs	†	
ILLINOIS		
Elizabeth C. Wood Course in Physical Therapy Northwestern University Medical School 303 East Chicago Avenue Chicago 11	†	†
IOWA		
Olive C. Farr Physical Therapy State University of Iowa Hospitals Iowa City		†
KANSAS		
Ruth G. Monteith Section of Physical Therapy Education University of Kansas Medical Center Kansas City 12	†	†
LOUISIANA		
Isadore Brown, Acting School of Physical Therapy Charity Hospital of Louisiana New Orleans 12		†
MASSACHUSETTS		
Adelaide L. McGarrett Physical Therapy Department Boston University Sargent College 6 Everett Street Cambridge 38	†	†
Constance K. Greene Department of Physical Therapy *Bouvé-Boston School, Tufts University Medford 55	†	
Shirley M. Cogland *Program in Physical Therapy Simmons College-Children's Hospital 300 Longwood Avenue Boston 15	†	†
MICHIGAN		
Virginia Wilson Curriculum in Physical Therapy University of Michigan University Hospital Ann Arbor	†	†
MINNESOTA		
Darrell D. Hunt School of Physical Therapy Mayo Clinic Rochester		†
Wilbur L. Moen Course in Physical Therapy University of Minnesota 860 Mayo Memorial Hospital Minneapolis 14	‡	

* Accepts women students only.

‡ Baccalaureate degree available from an affiliating college or university.

	Degree	Certificate
MISSOURI		
Sr. M. Imelda, S.S.M. Department of Physical Therapy St. Louis University 1325 South Grand Boulevard St. Louis 4	†	
Beatrice F. Schulz Department of Physical Therapy Washington University School of Medicine 660 So. Kingshighway St. Louis 10	†	
NEW YORK		
Dorothy L. McLaughlin Albany Medical College Division of Physical Therapy Albany 8	‡	†
Mary E. Callahan Courses for Physical Therapists Columbia University College of Physicians & Surgeons 630 West 168th Street New York 32	†	†
Elizabeth C. Addoms Physical Therapy Curriculum School of Education, New York University Washington Square East New York 3	†	†
Mildred F. Heap Program in Physical Therapy University of Buffalo 2183 Main Street Buffalo 14	†	†
NORTH CAROLINA		
Helen Kaiser Division of Physical Therapy Box 3403, Duke Hospital Durham		†
OHIO		
Robert D. Kruse Course in Physical Therapy Frank E. Bunts Educational Institute 2020 East 93rd Street Cleveland 6		†
Gladys G. Woods School of Physical Therapy Ohio State University University Hospital Columbus	†	†
OKLAHOMA		
Thelma Pedersen School of Physical Therapy University of Oklahoma, Medical Center Oklahoma City 4	†	†

* Accepts women students only.

‡ Baccalaureate degree available from an affiliating college or university.

	Degree	Certificate
PENNSYLVANIA		
Dorothy E. Baethke Division of Physical Therapy University of Pennsylvania Morgan Bldg., 205 S. 34th Street Philadelphia 4	†	†
Kathryn Kelley Curriculum in Physical Therapy D. T. Watson School of Physiatrics Leetsdale	‡	†
PUERTO RICO		
(All classes given in Spanish) Lutgarda V. Piñeiro School of Physical & Occupational Therapy Candelaria & Mandry Streets Stop 22, Santurce	†	†
TEXAS		
Doris E. Porter Grady Vaughn School of Physical Therapy Baylor University Hospital Dallas 1	†	†
Cecelia J. Lee School of Physical Therapy Hermann Hospital Houston 25	‡	†
Ruby Decker School of Physical Therapy The University of Texas Medical Branch Galveston	†	†
VIRGINIA		
Susanne Hirt School of Physical Therapy Medical College of Virginia Richmond 19	†	
WISCONSIN		
Beth J. Phillips Curriculum in Physical Therapy Marquette University School of Medicine 561 North 15th Street Milwaukee 3	†	
Margaret Kohli Course in Physical Therapy University of Wisconsin Madison 6	†	†
U. S. ARMY MEDICAL SERVICE		
*Physical Therapy Course Army Medical Service School Brooke Army Medical Center Fort Sam Houston, Texas Write to: The Surgeon General Department of the Army Washington 25, D. C. Att.: Personnel Division		†

Please direct all inquiries regarding tuition, entrance requirements and other specific information to the school and *not* to the American Physical Therapy Association.

Abstracts

Effects of Induced Hyperthermia on Some Neurological Diseases

Dewey A. Nelson, William H. Jeffries, and Fletcher McDowell (Second Neurological Division, Bellevue Hospital, First Avenue and 26th Street, New York), A.M.A. ARCH. NEUR. PSYCHIAT., 79:31-39, January 1958

There have been reports in the literature concerning the effects of induced hyperthermia on patients with multiple sclerosis. This study was undertaken in an effort to observe further these effects, and also to determine what effect induced hyperthermia has on patients with other neurological diseases.

A total of 100 patients was included in this study. Of this number, 16 were normal, 12 had multiple sclerosis, and 72 had other neurological diseases. The patients were checked prior to, during, and after immersion in hot water for vital signs, visual acuity, grip strength, deep tendon reflexes, pupillary size, dysarthria, nystagmus, range of extraocular movements, and mental state. The patients were immersed to the nipple line in a tub with water at 104 degrees F. After 5 minutes the water temperature was increased to 110 degrees F. and the patients remained in the water for 20 to 30 minutes.

Both the normal and the patient group showed mental changes. The changes were more frequent in the patient group, especially in the patients with multiple sclerosis.

Of the 16 normal subjects, only 3 showed neurological changes: 2 manifesting tetany, and 1 a decrease in grip strength.

Fifty-two of the 84 patients with neurological disease showed neurological changes. All of the multiple sclerosis patients included in this group showed changes. The changes were described under the following headings: oculomotor, visual, reflex, strength, and seizures.

Of the oculomotor changes, nystagmus was the most significant. Sixteen patients developed nystagmus during immersion; and in 17 patients who had preexisting nystagmus, the symptom was either exaggerated or became evident in additional directions. Nine of the 12 multiple sclerosis patients showed changes compatible with medial longitudinal fasciculus dysfunction.

Seven patients showed a decrease in visual acuity. Of these 7, 5 were patients with multiple sclerosis.

Plantar reflexes changed to normal in 2 patients, and to abnormal in 2 patients. Deep tendon reflexes were increased in 6 patients and decreased in 4 patients. There were no alterations in the tendon reflexes of the patients with multiple sclerosis.

A spring dynamometer was used to test grip strength, and a 25 per cent change from the control level was considered significant in determining a change in strength. Eleven patients showed a decrease in grip strength, only one was a patient with multiple sclerosis.

Three of 24 patients with a history of seizure disorders developed seizures during immersion.

It was found in this study that patients with multiple sclerosis developed neurological changes earlier and at lower elevations of body temperatures than the other patients. For this reason, the authors stated multiple sclerosis patients should be discouraged from taking hot baths.

The authors felt that the neurological changes found were the result of the direct effect of heat on the central nervous system.

Rehabilitation of Patients Following Glossectomy; Attempts to Reestablish Articulation and Maintain Normal Nutrition

Myra A. Herberman (Chief Speech and Hearing Therapist—Department of Physical Medicine and Rehabilitation, St. Vincents Hospital, New York), A.M.A. ARCH. OTOLAR., 67: 182-183 February 1958

From earliest times, the tongue has been associated in the public mind with the production of speech. Excision of the tongue was the penalty often selected as suitable punishment for those committing crimes of heresy and blasphemy. This mutilation was intended to prevent any further utterance of an antirelgious nature. It was noted that many victims of this ancient punitive measure retained the ability to speak. This was attributed to divine intervention.

Excision of the tongue in modern times is limited to cases of malignancy or trauma. Cancer of the tongue is the most frequent location of malignancy in the head and neck and this comprises 2 per cent to 3 per cent of all human cancer. Chewing, sucking, and swallowing are impaired as a result of glossectomy. Although popular opinion is still of the belief that the tongue is necessary in order to speak, substitute mechanisms can be established to hasten restoration of normal deglutitation and mastication through early management of a patient following surgery.

Two case histories are presented. The therapy included stretching, massage, and resistive exercises to all the muscles of the face and neck. The purpose was to increase mouth aperture and decrease contractures of the cheeks and lips. Circumduction of the neck was performed passively at a slow rate.

Feeding was achieved by first using a small plastic pastry tube of the plunger type which was filled with diluted infants food and inserted well into the oral cavity. Small quantities of food were introduced into the faucial region by pressing the plunger. The patient was instructed to "hold his breath" and swallow. By consciously elevating the soft palate, the nasal passage was closed off and swallowing performed without regurgitation. As mobility increased in the lips and neck, long handled spoons were substituted for the pastry tube. As skills improved and salivation controlled, a definite change was witnessed in the articulation and intelligibility of speech.

Success of training apears to depend upon (a) extent of mobilization and return of flexibility of muscles of facial expression, mastication, and muscles of the neck; (b) control of salivation. Normal swallowing and feeding activities can be induced by the use of devices designed to project food into the faucial region.

Hyperextension Injuries of the Cervical Spine

E. Alexander, C. H. Davis, and C. H. Field (Department of Surgery, Bowman Gray School of Medicine of the Wake Forest College, Winston-Salem, N.C.), A.M.A. ARCH. NEUR. PSYCHIAT., 79:146-150, February 1958

The severe injury to the cervical spinal cord which may occur without roentgenological evidence of fracture or dislocation to the cervical spine is often perplexing to physicians.

The authors' review of literature, illustrative experiments on cadavers, and roentgenograms of 3 patients indicate that extreme hyperextension of the cervical spine is probably one of the causative factors. Extreme hyperextension of a cervical spine already affected by degenerative arthritis may produce actual contu-

sion and laceration of the spinal cord. Narrowing of the normal sagittal diameter of the cervical spinal canal is often found in patients with hyperextension injuries.

The recovery of patients with hyperextension injuries varies with the degree of spinal cord injury. A slow progressive and continuous recovery aided by physical therapy may continue for months or years. There is often little indication for surgical intervention so these people are considered excellent subjects for rehabilitation. Although all four extremeties may be affected, the arms, and especially the hands, suffer more than the legs. The long term disability is greatest in the hands and rehabilitation is of paramount importance.

An Evaluation of Stripping Versus Ligation for Varicose Veins

K. A. Lofgren, A. P. Ribisi and T. T. Myers (The Mayo Foundation, Rochester, Minnesota), A.M.A. ARCH. SURG., 76:310-315, February 1958

A comparative evaluation of the results of surgical stripping versus ligation of varicose veins is presented. Two groups of patients chosen at random were studied. One group of 200 patients had, in 1940, received high ligation at the saphenofemoral juncture. The other group of 200 patients had, in 1950, undergone complete stripping in the lower extremities. Indications for surgical treatment in both groups was the presence of an incompetent greater saphenous vein as determined by various tests. Only patients still living at the time of follow-up examination were included. So as to keep out all factors that otherwise could influence the course of the varicose conditions, no person with an associated deep venous insufficiency was included in the study. Predominating symptoms reported by patients were aching, edema, heaviness, and cramping. Average duration of symptoms for each group was 15 and 16 years respectively. Complications included superficial ulceration, superficial phlebitis, and ruptured veins.

Evaluation of the results of each method of treatment was based entirely on objective findings noted at the time of follow-up examinations. Criteria for grading results included degree of breakdown of superficial veins, need for and amount of injection therapy for any persistent or new varices, and presence of large persistent varices that required further surgery.

Of 140 limbs examined 5 years or more after high ligation, 40 per cent were classified as excellent or good, 5 per cent fair and 55 per cent poor. Of 128 limbs examined 5 years or more after complete stripping, 94 per cent were classified as excellent or good, 6 per cent fair, and none poor. The incidence of recurrence requiring further surgical treatment was 36 per cent for limbs subjected to high ligation, whereas it was zero for limbs subjected to complete stripping. Recanalization of injected superficial veins and the presence of persistent perforating veins were important factors in the high recurrence rate after high ligation.

These results are convincing evidence of the superiority of complete stripping over high ligation in the surgical treatment of varicose veins. Advantages of the stripping procedure are: a better chance for lasting satisfactory results; an extremely low recurrence rate; less future disability from varicose veins; less loss of time for follow-up treatments. Disadvantages are: intensive and time-consuming surgery requiring general anesthesia; an initially greater time away from work; occasionally a slight delay in wound healing; confinement in a hospital.

Bursitis—Often An Inexact Diagnosis

Donald P. Carpenter (3616 Main Street, Riverside, California), CALIFORNIA M., 88:151-154, February 1958

"Bursitis" is used as a diagnosis loosely and generally to describe a number of clinical and pathological entities, among them "primary bursitis," "cystic degeneration," "calcareous deposits in ligaments and tendons," and so-called "chronic sprains" where no calcific deposit can be demonstrated.

"Primary bursitis" means primary inflammation of a bursa. If it is secondary to another process, then by definition it is a symptom and not a diagnosis. Primary bursitis is best seen in the olecranon or prepatellar areas where more superficially located synovial sacs become irritated from multiple traumata, hemorrhage or infection. Qualifying terms such as "septic," "traumatic" or "chronic villous bursitis" should be used.

A bursa is a synovial or serous-lined cavity so situated to allow motion between two opposing surfaces. Connective tissue has the property of undergoing mucoid degeneration, as noted in ganglia, Baker's cysts, etc. "Adventitious bursae" often form wherever connective tissue is under excessive friction—but no serosal or endothelial lining is present. Hence, many observers have described these cystic degenerations in many and varied locations as anatomical discoveries of new bursae. Such conditions would more accurately be described as "cystic, mucoid, or myxomatous degeneration." If in addition a sizeable bursa is involved, the diagnosis may be called "cystic bursitis" or "bursitis with cystic formation."

Calcareous deposits in the tendons and ligaments produce pain symptoms from an acute inflammatory reaction around the calcified deposit. The pathological change is in the tendon or ligament, although a bursa may or may not be secondarily inflamed. No area seems to be immune, but the rotator cuff and the supraspinatus tendon show the greatest incidence.

"Chronic sprain" has been used to cover a variety of lesions in ligaments, tendons, and for true bursitis, and needs be differentiated from them. Clinical features resemble those around calcified deposits where it is impossible to demonstrate a calcified mass. Connective tissue undergoes degeneration throughout life in relation to stress, vascularity, and reparative processes, and especially at attachments to bone (ligaments, tendons). Products of connective tissue degeneration produce nonspecific inflammatory reactions which may or may not calcify and may produce pain symptoms in the surrounding tissue. Hence, fluctuating aching pains, now in the shoulder or elbow or hip are often observed, maybe never acute but annoyingly persistent. There may or may not be a history of a traumatic episode. Palpation, X ray, and local injection effectively aid in localizing the fibrous trigger point.

Correct differential diagnostic terminology can obviate serious consequences. Confusing pain radiation of inflammatory tendinitis (with or without calcification) around the hip trochanter with sciatic neuritis from a herniated intervertebral disk may involve unnecessary surgery.

Thus, instead of such loose terms as Pellegrini-Stieda disease, tennis elbow, or epicondylitis, a diagnosis of "inflammatory tendinitis, supraspinatus tendon, left shoulder, with (or without) calcification," more reasonably describes the clinical manifestation.

Electromyography in Herniated Lumbar Disks

R. A. Mendelsohn, and A. Sola (Neurosurgical and Physical Medicine Services, Lackland Air Force Base, San Antonio, Texas), A.M.A. ARCH. NEUR. PSYCHIAT., 79:142-145, February 1958

The authors report on a study which they conducted to evaluate electromyography as a practical clinical aid in the localization of herniated lumbar disks. The records of 45 patients who had electromyography, iophendylate myelography, and surgically verified protruded lumbar disks were reviewed.

Forty surgically verified cases of protruded lumbar disks had accurately localizing electromyograms. Thirty-eight cases had accurately localizing myelograms. The authors infer that electromyography is of clinical value in the localization of protruded lumbar disks. They state that an experienced electromyographer would be of particular value in examining those patients whose lumbar disks are not localized by myelography, and also for those physicians who prefer to avoid myelography or who might wish to use both types of examination in selected cases. The test also finds application in medicolegal problems since electromyographic findings are admissible as evidence in courts of certain states. Industrial commissions and insurance companies might be able to utilize electromyographic findings as objective evidence.

The use of electromyography with myelography should materially aid in the localization of protruded disks, particularly in the group of clinically suspected protruded lumbar disks with normal myelograms.

The Phylogenetic Significance of the Chondro-Epitrochlearis Muscle and its Accompanying Pectoral Abnormalties

Stuart O. Landry, Jr. (Department of Anatomy, University of Missouri School of Medicine, Columbia, Mo.), J. ANAT. LOND., 92:57-61, January 1958

The chondro-epitrochlearis muscle is an anomalous slip detached from the ventral edge of the pectoralis major, running down the medial side of the arm to insert on to the medial epicondyle. When this rare muscle is found in man, it is regularly accompanied by an abnormally inserted pectoralis major. A review of the reports of 13 authors who described the chondro-epitrochlearis muscle revealed also that the normal twisting of the pectoralis major insertion was missing.

In most mammals, the pectoralis major inserts farther down the humerus than it does in primates. In quadrupeds, the pectoralis minor inserts largely on to the upper end of the humerus. When the insertion of this muscle migrated to the tip of the coracoid process in primates, a part of the pectoralis major moved its insertion to the region formerly occupied by the minor.

This author found progressively less twisting of the pectoralis major insertion in primitive primates and no twisting in most order of mammals. The partially untwisted insertion of the pectoralis major found with a chondro-epitrochlearis is obviously reminiscent of primitive quadrupedal insertion.

The author did not comment on the function of this muscle in man. The muscle described was discovered by medical students during an anatomy dissection course.

Comminuted Fractures of the Lower End of the Radius

O. C. Hudson and T. J. Rusnack (Orthopedic Service, Meadowbrook Hospital, Hempstead, New York), AM. J. SURG., 95:74-80, January 1958

The authors feel that the usual closed method of treatment of comminuted fractures of the distal end of the radius in adults is often inadequate. A deformity of radial deviation of the hand, prominent ulnar styloid and loss of motion in rotation occurs. It is the shortening of the radius during healing that disrupts the distal radioulnar joint and decreases ulnar tilt which causes this disabling deformity.

This report deals with an evaluation of 25 cases of fresh comminuted fractures that were treated by resection of 1 inch of distal ulna followed by closed reduction of the radius. Following surgery, a long arms cast was applied. The elbow was placed in 90 degrees of flexion, the hand in full supination, and the wrist was placed in either neutral or slight flexion. The total period of plaster immobilization was 10 to 12 weeks.

Finger and shoulder exercises were instituted immediately after reduction. Passive motion was never advised and active motion only was emphasized. The exercise regimen must be done hourly throughout the day and each joint must be exercised through its full range of motion 20 times an hour. After removal of the cast, hot soaks to hand and wrist were instituted.

Good or better results were obtained in 22 patients. Two of the remaining patients improved with local infiltration of hydrocortisone into region of amputated ulna. In one case, the result remained poor.

Use and Abuse of Ambulation Training in Rehabilitation

A. S. Abramson (Department of Rehabilitation Medicine, Albert Einstein College of Medicine, New York), POSTGRAD. M., 23:178-185, February 1958

Training disabled persons to get about on foot is well established rehabilitation procedure. It affords functional, metabolic and obvious psychological benefit.

Some disabled persons do not have the physical capacity for the development of safe independent and efficient ambulation. Safety means a stable standing posture and gait with minimal risk of trauma. Efficiency means that the energy reserve adequately exceeds the energy cost of ambulation. Programs which exceed the patient's ability are an abuse of ambulation training.

The author discusses several clinical situations associated with overt disabilities—namely, osteoarthritis of the hip, synovitis of the knee, amputation, hemiplegia, and paraplegia.

Ambulation can be either beneficial or harmful. It can preserve tissue or damage it depending upon the available reserves and the price of the ambulation goal. Acute constitutional manifestations of rheumatoid arthritis, vascular disease, reduced cardiac and respiratory functions, marked joint destruction, extensive amputation, marked motor paralysis—all reduce the reserve. Such factors as disuse atrophy of muscle, lack of training, joint contracture, sensory loss, obesity, and spasticity increase the price. Delay in establishment of rehabilitative procedures further intensifies these factors.

No clinical method yet devised will replace experience and judgment in determining these reserves and costs. Excessive conservatism should be avoided but also overoptimistic expectations may lead to frustrations for both patient and doctor.

Indications for Lumbosacral Fusion

J. R. Black (1930 Wilshire Boulevard. Los Angeles), CALIFORNIA M., 88:12-15, January 1958

Hibbs first described a technic for a spinal fusion in 1911. Since then newer and improved technics have evolved. However, the problem of when to do a fusion has not been entirely eliminated.

Various theories of the causes of low back pain have been entertained through the years. They include sacroiliac disease, mechanical weakness of the spine, poor posture, congenital anomalies of the vertebral bodies, facets, and laminae. However, disk degeneration and increasing incidence of degeneration with advancing age should be considered as the underlying causes of the above mentioned spinal weakness. With disk degeneration and perhaps later slipping of disks, symptoms of low back pain appear.

The patient's age is an important factor to consider before surgery. Disk degeneration increases with age. Incidence of disk protrusion does not coincide with the increase in degeneration. Studies have shown that 50 per cent all persons with disk degeneration were over 50-60 years of age, whereas peak incidence of disk protrusion occurs between 30-40 years of age. Protrusion depends on disk degeneration and water content of the nucleus pulposus. The latter permits the disk to be squeezed out of normal position. Though degeneration continues with age, the water content of the disk is less, the disk is firmer, and slipping is less likely to occur.

Psychological and economic factors and industrial cases have a bearing on indications for operation and also upon the results of surgery. Severely emotional patients escape problems by blaming a bad back. Other neurotic patients benefit from a reduction in pain. Yet, rarely does disk excision lead to complete unawareness of the back in all activities. Where economic circumstances permit, prolonged conservative treatment may be tried. If income is limited and pain severe, early operation may be advisable. In industrial injuries, expectation of final compensation sometimes delays recovery even after successful treatment.

Evaluation of herniated disk treatment is subjective from the valuator's viewpoint. Some neurosurgeons have emphasized the relief of leg pains, residual back pain not being considered important. Others have evaluated results by whether the patient returned to his former work.

Indications for surgery of the lower back for patients with or without sciatica should consider all the foregoing factors. In addition, the patient should be in good general health, and for spinal fusion, the patient should be less than 50 years of age. Any prospect of relief of back pain is less in persons over 50 years of age because of the greater incidence of degenerative changes in parts of the spine not operated on.

A trial of several weeks of conservative treatment (bed rest and traction) should precede any decision to operate.

Type of operation depends upon examination findings. For backache alone, only spinal fusion can expect satisfactory results. For spondylolithesis, fusion of the involved segments is recommended. For protruded disks at the lumbosacral level, if the spine above the 5th lumbar vertebra is normal, the damaged part should be fused. If the spine above the 5th lumbar vertebra evidences degeneration changes, fusion should not be carried out, since other spinal areas could give rise to backache. Protruded disks at the 4th lumbar level or above should not be fused routinely since the incidence of pseudoarthroses increases if more than one joint is fused; this may offset the advantages of excision alone. Where reoperation is done because of persistent disabling back pain, with or without sciatica, fusion of the affected area should be routine, except for patients over 50 years of age.

Comparison of Certain Tests of Physical Fitness and Certain Bodily Measurements

E. R. Elbel, K. M. Reid and D. E. Ormond (University of Kansas, Lawrence, Kansas), J. APPL. PHYSIOL., 12:37-41, January 1958

The obvious incentive exists for the adoption of an operational definition of physical fitness, based on the results of physiological testing. These tests should meet adequate and meaningful criteria. These criteria include (a) internal consistency (different cardiovascular tests should yield similar results) and (b) external reliability (qualitative agreement should obtain between results). Test procedures and scoring methods should be consistent with the results of physiological investigation.

This study attempts to determine the interrelationships of certain simple fitness tests and certain bodily measurements. Fifty normal subjects, all male university students, with varying degrees of fitness, were tested. Weight, height, chest girth during inspiration and expiration, vital capacity, leg length and the Tuttle Pulse-Ratio Test were given on one day. The next day, the flarimeter and the Harvard Step-Test were administered.

The results of this study corroborate the opinion of other workers that there is a positive relationship between vital capacity and height, weight and chest girth. The lack of significant relationship between vital capacity/body surface area and other tests would seem to cast a doubt on the validity of using this index alone for evaluating the physical fitness of healthy male subjects.

The insignificant coefficients of correlation obtained between the flarimeter and other tests suggest that the flarimeter is more a measure of the ability to endure discomfort than a measure of physical fitness. The more ponderous person apparently is predisposed to a lower resting heart rate. Further investigation of the relation between the Harvard Step-Test and anthropometric measurements is warranted. The Harvard Step-Test favors subjects with low resting pulse rates and the Tuttle Pulse-Ratio Test favors subjects with high resting pulse rates.

Discussion: Hydrotherapy. Is It of Value?

R. Harris, (Buxton), J. H. Jacobs (London) and T. G. Reah (Harrogate), PROC. R. SOC. M. LOND., 51: 94-100, February 1958

It appeared to Dr. Harris that although hydrotherapy had been investigated from the physiological standpoint, clinical value remained a question. Since it is used often for cases of inexact diagnosis, accurate assessment of progress is difficult and even more so for the fact that hydrotherapy is used as an additional type of therapy.

As an exercise medium, use of water is demonstrated to satisfaction but there is no clinical proof of its effectiveness. Can dry heat or moist packs be as effective as the pool? Relaxation exercises have been proved by Dr. Harris to be almost equal to results from the water. The cold douche, contrast baths, a hot

whirlpool and nonagitated baths were considered and the over-all impressions were that exercise and relaxation in warm water was useful in locomotor diseases and disabilities and psychomotor disorders. However, controlled clinical trials were considered urgently needed for hydrotherapy.

Dr. Jacobs discussed spa treatment and maintained that there was more psychological value than physiological. He emphasized, however, that graded exercise using water assistance and resistance was helpful and that early ambulation was possible with limited weight-bearing. Pools also could be used for reestablishing coordination patterns but individual reeducation was best accomplished on dry land. Hydrotherapy is beneficial in early poliomyelitis, chronic arthritis and postoperative orthopedic conditions. However, Dr. Jacobs doubts the superiority of hydrotherapy over sling exercises and short wave. He fears that the abuses may outweigh the uses.

Dr. Reah mentioned briefly the effect of hydrotherapy on breathing exercises, concluding that it was of doubtful value. He also expressed the belief that although this may be empirical therapy, if tempered by critical outlook and with recognition of responsibilities toward the patients, it still holds an important place in medicine. He speaks much in favor of the Hubbard tank and deep pool where movements can be more easily watched than in slings and in which relief of pain and spasm is markedly apparent.

I. A Study of the Public's Acceptance of the Salk Vaccine Program

Melvin A. Glasser (National Foundation for Infantile Paralysis, New York), AM. J. PUB. HEALTH, 48: 141-146, February 1958

II. Attitudes of Californians Toward Poliomyelitis Vaccination

M. H. Merrill, A. C. Hollister, S. F. Gibbens, A. W. Haynes and V. H. Leslau (California State Department of Health), AM. J. PUB. HEALTH, 48:146-152, February, 1958

This was a two part study conducted by the National Foundation for Infantile Paralysis to determine the factors influencing the way people react to a health program. A year and a half after the Salk Vaccine was declared safe and effective, a total of 3,509 personal interviews were conducted on a nationwide basis. Interviews included a sample of adults under 40 years of age, a sample of mothers of teenagers, and a sample of mothers with children of all ages under 21.

Although the first study revealed that there was broad knowledge of the vaccine, comparatively few people were taking advantage of the vaccine for themselves and their children. Some 64 million Americans have had one or more polio injections but there remain 45 million Americans under 40 years of age who have yet to get their initial immunization shot, and another 30 million who require one or more injections to complete their vaccination.

Some of the more significant findings of the study reveal that only 1 in 8 adults (21-40 age group) had started vaccinations; 2 out of 5 teenagers, 3 out of 5 under 7 years of age, and 3 of every 4 between ages 7 and 12 had received one or more shots. Regional variations showed only a somewhat lower rate in the South where it was felt that low economic and educational status must be taken into account; and also among teenagers of the Mountain and Pacific States where it seemed there was an aftermath of the "Cutter" incident.

Failure of adults to make use of the vaccine was traced largely to two factors: procrastination and the feeling they were not susceptible to the disease. Also related was the belief that victory over polio had been achieved. Lack of specific knowledge about the disease was evident when parents expressed belief that teenagers were not as susceptible as younger children often hearing poliomyelitis referred to as "infantile paralysis" and always picturing a child on crutches. Confusion as to availability of the vaccine was another factor. Educational level provided a relationship with persons of higher education and better incomes knowing more about the vaccine and threat of polio, and accordingly, having more likely been immunized. Largely dispelled were doubts about the safety and efficiency of the Salk vaccine. There were inconclusive findings concerning the cost of vaccinations. However, this seemed not a major deterrent. Physicians seemed to play a major role since the majority of people interviewed said they would be vaccinated if their doctor recommended it. These same nonvaccinated adults, on the other hand, were found less likely to visit their doctors regularly. Sources of information mentioned by adults were (a) my doctor, (b) local NFIP Chapter, and (c) city, county health officers. Lastly, in an over-all analysis, it appeared that social factors were more influencing than psychological or economic. People tend to behave in the way their friends do; thus the social activity of talking about vaccination is a major determinant of vaccination itself.

The California study was based on two things: case rates in California, since 1940, have usually exceeded the nation's average, and almost half the people contracting polio following administration of the Cutter vaccine were residents of California. The sample included 1 out of every 1,200 households in the state with personal interviews. Of the mothers questioned, 81 per cent were favorable to polio vaccination, 11 per cent unfavorable, and 8 per cent neutral. Interpretation of findings showed similarity with the national pattern. Misunderstanding as to age groups eligible was a major factor, the difficulty arising, it was felt, due to the emphasis on the priority age group (5-9) during the time Salk vaccine was in limited supply. Favorable attitudes resulted from aggressive cooperative programs, evidenced by San Diego County where the Cutter incidence occurred. Fewer mothers in this area gave a fear response and larger number of children had been vaccinated. Again, lack of understanding of the effect of poliomyelitis upon adults was reflected as was the fact that people of every group tend to think and act according to their perception of the way their friends think and act.

The results of this study were used to plan further programs to improve administrative practices and health education activities.

The Pathology and Surgical Treatment of Complicated Cerebral Palsy

Samuel Rosner (Director of the Department of Experimential Neurology and Neurosurgery of Stuyvesant Polyclinic, New York), ARCH. PEDIAT., N.Y., 75:1-10, January 1958

The definition of cerebral palsy according to this author is a nonfamilial paralysis or paresis of one or more limbs which occurs before the first year of life. It may be of the spastic, rigid or choreiform athetotic

type. The "complicated" patient is the one who is also suffering from mental deficiency, epilepsy, or both, in addition to the motor deficiency.

In 50 of the 52 patients studied in this series subjected to craniotomy, a venous or arteriovenous angioma was discovered unilaterally in the region of the lower angle of the Sylvian fissure. One child had a subarachonoid cyst of the posterior fossa with hydrocephalus and the other child showed a unilateral cerebral venous angioma with subarachnoid cyst.

Many investigators stress the fact that intracranial bleeding at or before birth is a potent cause of birth paralysis. It is the authors' opinion that temporary anoxia or prolonged hypoxio of the brain is the underlying cause for brain dysfunction.

The surgical procedure is described and progress of six patients noted. The majority of cases show improved motor power. Mentality in every case improved, strabismus improved, and swallowing and respiration also improved. The athetotic patients do not improve as rapidly as the rigid or spastic ones and epileptic attacks are less frequent and of shorter duration.

The pathology found in these complicated cases of cerebral palsy represents a definite entity; namely, unilateral angioma in the region of the lower angle of the Sylvian fissure. The brain may be affected bilaterally because of the peculiar anastomosis of the involved area. Physical therapy and speech therapy are recommended after surgery as the patients are in a better position to benefit from these therapeutic measures.

Surgical removal of the angioma by electrocautery has resulted in definite improvement in the clinical state of children with complicated cerebral palsy so that it is no longer feasible to consider these children as hopeless.

Diagnosis and Treatment of Facial Pain

George W. Smith (Division of Neurological Surgery, The Medical College of Georgia, Augusta), J. AM. N. Assoc. 166:857-866, Feb. 22, 1958

Facial pain is perhaps the most agonizing of all benign afflictions and may be caused by either intracranial or extracranial conditions. The latter include dental disease, tumors, or infected cysts of the mandible, disturbances about the temporomandibular joint, lesions involving nasal accessory sinuses, elongated styloid process, tumors involving the trigeminal ganglion and nerve, and aneurysm or anomalies of certain arteries. The best known clinical syndrome marked by facial pain is trigeminal neuralgia or tic douloureux. This often is referred to as trifacial neuralgia or facial tic although these are misnomers. Tic douloureux is generally seen in patients in the advanced years although a history of initial facial pain at an early age followed by years of remission is not rare. In the cases seen the female sex predominates. The site of tic douloureux is most frequently in the mandibular distribution and is usually unilateral in occurrence. The usual history is one of pain in the mandibular division and as the attacks become more frequent, there seems to be a spread to the maxillary division. Treatment by root section generally gives relief of pain, but the price that patients pay for complete relief is total anesthesia in the corresponding area.

Glossopharyngeal or ninti. nerve neuralgia, does not occur as frequently as tic douloureux, however, it is a clinical entity. One of the more rare afflictions is geniculate ganglion neuralgia or seventh nerve neuralgia. The most troubling differential diagnosis the physician is called upon to make as far as facial pain is concerned is that which is known as atypical facial neuralgia. These patients have all been described as having pain of psychogenic origin and therapeutic attempts to relieve this condition have been difficult.

Occult Fractures

Rudolph S. Reich and Norman J. Rosenbert (Department of Orthopedics, Mount Sinai Hospital, Cleveland), J. AM. M. Ass., 166:563-568, Feb. 8, 1958

When the cardinal signs of fracture are present, the responsibility for diagnosis lies with the clinician and the roentgenogram is only an aid to diagnosis. Great numbers of undisplaced fractures remain undiagnosed because the suspected area is not properly centered on the X-ray films. Many such occult fractures still remain untreated and are the cause of much pain, anxiety, disability, and expense. In children, occult fractures usually occur at the epiphyses or as greenstick fractures of the long bones. Spiral fractures of the tibia with intact fibula are often occult, but inability to bear weight, trigger tenderness, and swelling over the shaft of the tibia contribute to establish the diagnosis. Fractures of the head or neck of the radius are among the most common occult fractures, and occur as a result of a fall on the outstretched arm. There is a history of painful limitation, tenderness, and swelling over the head of the radius. Although the hip joint is well covered by muscle and adipose tissue, undisplaced fractures of the neck of the femur are sufficiently common that they should be suspected. Painful limp, usually following a misstep and accompanied by limitation of motion of the hips suggests the probability of such a fracture. The reparative process following an occult fracture often does not stop until it extends into ligaments and other soft tissue. This forms intra-articular and periarticular pieces of bone which may be the source of permanent disability, especially in untreated fractures of the foot and ankle. Many of these patients have been treated for a "sprain," but the so-called "sprain" which remains acutely painful and still shows tenderness and swelling should be immobilized.

Discussion on Nerve Pressure Syndromes: The Problem of Paresthesia in the Upper Limb

Dr. I. Meanock

New Methods of Investigating Peripheral Nerve Lesions

Dr. R. W. Gilliat PROC. R. SOC. M., LOND., 51:87-94, February 1958

Dr. Meanock first discusses the cervical rib syndrome as a variable combination of anatomical, physiological, and pathological features. The vascular component often produces pain in the forearm, coldness and cyanosis of the digits, and intermittent obliteration of the radial pulse. Nervous symptoms include muscle wasting, and sensory loss along definite lines of distribution. Increased nocturnal pain is thought to be due to increased pressure resulting from the supine position. The syndrome is more common in middle aged women who have chronic fatigue or have had unaccustomed use of their hands. Rest is considered the most effective conservative cure with surgery advocated for only extremely severe cases.

Cervical spondylosis is usually part of senescence and is symptomless but

occasionally protrusion of the annulus fibrosus with associated disk degeneration produces insidius burning sensations radiating down the upper limb to the digits. Because posterior root innervations are widespread, there is difficulty locating the specific area of pain. Motor involvement is unusual but on occasion is so rapid as to be confused with poliomyelitis. A "frozen shoulder" may result from splinting against pain; hence, the cause should be remedied before the effect. Cervical spondylosis is often misdiagnosed but once discovered, treatment consists of a sling for resting the part and shoulder exercises.

The initial symptom of median nerve compression in the carpal tunnel is always sensory with increased burning sensation at night. Motor disturbance may follow with weakness of the opponens and abductor pollicis brevis. Palmar sensation is not usually affected but pain deep in the wrist and radiating to the shoulder can be elicited by extension of the wrist which produces greater pressure in the carpal tunnel. Treatment includes splinting of the wrist, injection of hydrocortisone, or open operation.

Dr. Gilliat uses a cuff or tourniquet to test for the carpal tunnel syndrome. The median nerve was found to be extremely sensitive to blood supply changes; lack of blood causing severe pain with tingling in the median-supplied fingers. Sensory loss distribution is also characteristic.

However, Dr. Gilliat prefers the electrical method of stimulating the nerve at the wrist and picking up action potentials with surface electrodes located above the elbow. Sensory reactions are tested by stimulating the index and little finger and recording the volley at the wrist. These are used in conjunction with motor nerve conduction velocity.

Characteristics of several peripheral nerve lesions were also summarized.

A Guide to the Evaluation of Permanent Impairment of the Extremities and Back Compiled by the Committee on Medical Rating of Physical Impairment

J. AM. M. ASS., Special Edition, Feb. 15, 1958

Evaluation or rating of permanent disability has long been recognized as an important and complex subject. In the past much confusion has resulted from inadequate understanding by physicians and others of: (a) the scope of medical responsibility in the evaluation of permanent disability; and (b) the difference between permanent disability and permanent impairment. It is vitally important for every physician to be aware of his proper role in the evaluation of permanent disability under any private or public program for the disabled. It is equally important for him to have the necessary authoritative material to help him carry out his particular responsibilities—the evaluation of permanent impairment which is a purely medical condition and always a basic consideration in evaluation of permanent disability. Permanent impairment is an appraisal of the nature and extent of the patient's illness or injury as it affects his personal efficiency in the activities of daily living. Competent evaluation of permanent impairment requires adequate and complete medical examination, accurate objective measurement of function, and avoidance of subjective impressions and nonmedical factors which are difficult to measure; therefore, it is this evaluation which is the function of the physician and becomes the real criterion of permanent disability.

The Committee on Medical Rating of Physical Impairment believes that, unlike disability which is an inclusion of nonmedical factors, permanent impairment can be measured with a reasonable degree of accuracy and uniformity on the basis of impaired functions as evidenced by loss of structural integrity, pathology, or pain. For this reason the Committee has undertaken to prepare a series of guides as a comprehensive practical system for evaluation of permanent impairment by individual body systems or of the whole man.

This particular guide deals with permanent impairment of the extremities and the back. It is arranged in three sections dealing with: (1) the upper extremity, (2) the lower extremity, and (3) the back. Each section contains material on:

1. Technic of measurement;
2. Tables of relative impairment due to restriction of motion, ankylosis, amputations, fractures and other conditions;
3. Methods for combining and relating various impairments.

In developing the tables of relative impairments in this guide, ranges of motion to be measured and certain basic values were scientifically established on the basis of:

1. Analysis of anatomical and physiological factors underlying functions; and

2. Lengthy and comprehensive professional experience and observation.

It is the purpose of this and future reports by the Committee to correct a past confusion of terms and to provide a series of practical guides to the evaluation of various types of permanent impairments.

Electromyographic Study on Respiratory Movements of the Intrinsic Laryngeal Muscles

F. Nakamura, Y. Uyeda and Y. Sonoda (Department of Otolaryngology, Kyoto Medical College, Kyoto, Japan), LARYNGOSCOPE, 68:109-119, February, 1958

In this study, electrical activity in five intrinsic laryngeal muscles of an anesthetized dog was examined with electromyographic recordings. The muscles under study were the adductor muscles including the thyroarytenoid, cricoarytenoid lateralis and interarytenoid which, when contracting, cause approximation of the vocal cords with consequent narrowing of the glottis; the cricothyroid which is believed to regulate the length or tension in the cords and complete the degree of adduction; and the cricoarytenoid posterior which abducts the arytenoid cartilage and widens the glottis.

When the needle electrode was inserted into the muscles, the adductors, except the thyroarytenoid which remained quiet throughout the respiratory cycle, showed activity during expiration, while the abductor was active during inspiration.

Although the majority of the motor units fired phasically, some units showed a continuous train of impulses whose frequency rose and fell with the respiratory cycle. From these findings, it may be assumed that, functionally, the motor units in the laryngeal muscles fall into two groups, one group performs a phasic contraction during respiration, the second serves to maintain the muscle tone underlying the phasic movements. The activity observed in the laryngeal muscles showed a close similarity to that of previous studies of intrinsic respiratory muscles.

Previous experiments have showed that the glottis performs useful respiratory movements by widening this section of the air passage just prior to inspiration, thereby reducing the resistance to air flow. In the experi-

ment under consideration, no change was observed in activity after detachment of the trachea, which indicates that respiratory movements of the glottis may be controlled centrally without reference to local sensory information.

From this electromyographical study, it was concluded that the laryngeal muscles, as well as muscles of the wings of the nares and bronchi, should be called regulator muscles of the respiratory passage, which serve to reduce resistance to inspired air, giving it the appropriate load to keep respiration deep and regular.

Physiologic Studies Before and After Upper Dorsal Sympathectomy

L. T. Palumbo and S. W. Shapiro, (Department of Surgery, V.A. Hospital, Des Moines, Iowa), ANN. SURG., 147:261-263, February 1958

In April 1953 a more direct and easier surgical technic was developed for upper dorsal sympathectomy, consisting of resection of the first to fifth thoracic ganglia and associated chains, with division of the respective rami and branches. Complete sympathetic denervation of the head, neck, shoulder and upper thorax and upper extremity, heart, coronary vessels, and other tissues and organs within the thoracic cage, was produced.

Indications for surgical treatment (bilaterally in 16 cases, unilaterally in 15 cases) included angina pectoris, coronary insufficiency due to peripheral arteriosclerosis, Raynaud's phenomenon, and paroxysmal tachycardia. Patients ranged from 25 to 69 years of age, with 50 per cent over 50 years of age. To study any physiologic changes, tests were made before and after sympathectomy: exercise tolerance (master 2 step), response to cigarette smoking (ECG), fluorocardiogram, esophogram (motor barium studies), sweat test (Miner's-starch-iodine), ENT examination for mucosal changes, vital capacity, temperature recordings (axillary and oral), blood pressure recordings (in lying, sitting, and standing positions), pupil photographs (before and after stellate ganglion blocks).

Results revealed no significant physiological disturbances or undesirable sequelae. In 28 cases a Horner's syndrome did not occur when the lower part of the stellate ganglion was resected and the first to fifth thoracic rami were divided. Hence, this study reveals that the sympathetic pathways to the eye do not traverse the first thoracic ramus to enter the lower part of the stellate ganglion. This finding is contrary to current concepts concerning these pathways.

Such surgical procedure does not impair the socioeconomic status of a patient. The body apparently is able to compensate in some way for the areas of denervation. The procedure has a wide clinical application and can be accomplished with a minimal morbidity and mortality rate.

Our Abstracters for June

Rachel Adams	Elizabeth Davies
Joan Brewer	Geraldine Midgley
Dorothy Briggs	Miriam Partridge
Sam Chelemsky	Alfred Szumski
Betty Conaway	Jean Thibaut

Book Reviews . . . . .

Occupational Therapy: Principles and Practice. *By William Rush Dunton, Jr., M.D., Founder and Former Editor of Occupational Therapy and Rehabilitation, And Sidney Licht, M.D., Editor Emeritus of the American Journal of Physical Medicine* with 17 Contributors. *Ed. 2. Cloth; price $8.00. Pp. 373; illus. Charles C Thomas, Springfield, Ill., 1957.*

Dr. Dunton and Dr. Licht are well versed in the use of occupational therapy as a rehabilitative procedure and well qualified to edit a source book for physicians seeking information on the subject. Dr. Dunton served for many years as the editor of the journal, *Occupational Therapy and Rehabilitation*, and Dr. Licht succeeded him in this capacity. Both of them have had broad experience in the use of occupational therapy and have contributed much to its development.

This second edition is greatly broadened in scope by the inclusion of additional chapters on: Appliances and Remedial Games, Music for the Hospitalized Patient, Occupational Therapy in Pediatrics, The Upper Extremity Amputee, and Occupational Therapy in Geriatrics. The chapter on Bibliotherapy in Psychiatry has been rewritten and that on Cerebral Palsy largely revised. The other chapters have been revised to include new developments in treatment technics, especially the use of the newer drugs in psychiatry and tuberculosis.

The physical therapist who is primarily interested in the restoration of physical function and the use of occupational therapy for this purpose will find the chapters on Kinetic Occupational Therapy, Pediatrics, Cerebral Palsy, and Upper Extremity Amputees of most value. However, those interested in the broader scope of occupational therapy will find the other chapters of very real interest.

The editors have been most discriminating in their selection of chapter authors which has resulted in the compilation of an excellent source book. Each chapter has reference material which may be very useful. There are a number of charts and drawings of specialized equipment.

Speech Correction at Home. *By Morris Val Jones, Ph.D., Director of Speech and Reading Clinic, Morrison Center for Rehabilitation; Instructor in Speech, Golden Gate College, San Francisco, California. Cloth; price $4.75. Pp. 160; illus. Charles C Thomas, Springfield, Ill., 1957.*

The author of this book, which includes an appendix of 40 practice exercises in the sounds of English, is a speech therapist with public school and private experience. The book is intended primarily for the use of untrained persons who may desire to help someone in overcoming a speech defect. It is further intended as a reference book for professional workers having some other relationship with speech defective persons—as doctors, dentists, teachers, counselors—but the author does not intend that the book in any sense replace the trained speech therapist.

The book includes brief discussions of normal speech and language development; the failure to develop speech, investigation of causes, and general developmental procedures; a general approach to correcting faulty speech; stuttering; esophageal speech; and aphasia.

The author seems to have given his most sympathetic treatment to his discussion of stuttering, and it is likely that this material will be of considerable help in approaching this

problem, sometimes a very serious one not only for the stutterer but his family and friends. The problems of learning esophageal speech (after surgical removal of the larynx), and of regaining speech after aphasia (caused by certain forms of brain damage), are also discussed with clarity and encouragement.

This reviewer feels, however, that the materials on cleft palate (less than 3 pages) and on cerebral palsy (3 pages) are too limited, even in this admittedly condensed setting, to be practically serviceable to those beset by the psychological as well as physical difficulties of these handicaps.

The book contains well presented phonic and phonetic materials, which would be of considerable usefulness to untrained persons attempting to help someone toward phonetic improvement.

Applied Muscle Action and Coordination. *By Kathleen I. McMurrich, Lecturer, Department of Anatomy, University of Toronto, Canada. Cloth; price $3.75. Pp. 92; illus. University of Toronto Press, Toronto, Canada, 1957.*

This small text was written primarily to assist the student of occupational therapy in applying basic knowledge of muscle action and coordination to specific technics utilized in occupational therapy.

The author intentionally omitted anatomical details which are readily available to the student in standard textbooks. It is taken for granted that the student is acquainted with basic anatomical as well as physiological facts. The major muscles of the entire body are discussed individually in regard to basic structure and main functions. Surface anatomy is taken into consideration where palpation and observation of muscle contraction facilitate the understanding of muscle function.

In the introduction, the author presents a brief survey of the basic kinesiological features necessary for the understanding of coordination of movement. In discussing individual muscles, relationship to gravity and synergistic grouping are considered. The features of muscular paralysis are described.

Reading through this text one is certain that the author possesses a broad background and understanding of the topic she is discussing. However, unfortunately as it has been done in many previous texts of this kind, brevity seems to have been one of the most important goals. One therefore wonders how much a beginning student, even one adequately prepared in basic anatomy and physiology, can learn from reading as brief a text as this.

The author is pointing out that the application of craft work, games for exercises, for restoration of function can be varied indefinitely if the therapist's knowledge of muscle action and coordination is adequate. It is regrettable that few textbooks are written specifically to assist the student in reaching this conclusion on the basis of his own understanding. This text may well be of some assistance to physical therapy students who can supplement the information given with more extensive lecture notes.

Steps for Today Toward Better Mental Health. *Edited by Josephine Nelson and Elizabeth M. Dach. A Report of the 1957 National Health Forum, March 20-22, 1957, in Cincinnati, Ohio. Paper; price $1.50. Pp. 118. National Health Council, New York, 1957.*

Steps for Today Toward Better Mental Health is a report of the 1957 National Health Forum highlighting the increasing problem of mental illness and presenting ways of meeting this major health problem.

The publication is divided into five sections. The first section, "Better Mental Health–Challenge to All Health Services," presents facts and the philosophy of such eminent speakers as Francis J. Braceland, M.D., President, American Psychiatric Association; Harold D. Lasswell, Ph.D., Professor of Law and Political Science, Yale University; Margaret Mead, Ph.D., President, World Federation for Mental Health; G. Mennen Williams, Governor of Michigan; David B. Allman, M.D., F.A.C.S., President, American Medical Association; and Jack R. Ewalt, M.D., Commissioner, Massachusetts Department of Mental Health. The next three sections: "Helping People to Meet Crises," "Promoting Mental Health," and "Community Action for Mental Health" are reports of a series of panel discussions. The last section is a summary symposium, "Toward New Horizons."

This material represents the thinking of many leaders in the field of mental health and is of general interest to all physical therapists. Of particular interest is the panel discussion entitled "Dealing with Mental and Emotional Aspects for Varied Illnesses and Disabilities."

Postural and Relaxation Training in Physiotherapy and Physical Education. *By John H. C. Colson, F.C.S.P., M.S.R.G., M.A.O.T., Principal, School of Remedial Gymnastics and Recreational Therapy and Director of Rehabilitation, Pinderfield's Hospital, Wakefield, England. Cloth; price $2.50. Pp. 105; illus. Charles C Thomas, Springfield, Ill., 1956.*

Have you had difficulty training a patient in standing postural alinement so there is coordination between the abdominal muscles and thoracic extensors with proper breathing?

In Section I, this manual "gives a postural training program which teaches the patient to adopt the correct posture in a series of starting positions which are graded progressively from crook lying to standing." There is a general description of gross postural defects followed by a training scheme to establish new postural reflexes. A physician should determine which posture is best for the person. The author's program considers training for children and adults.

Section II, "Relaxation Training," is approached through the usual segmental positioning and tension and relaxation of muscle groups.

A short chapter on "Psychosomatic Tension States," briefly but clearly gives the psychological aspects of the problem of clinical manifestations of anxiety as exhibited in defense mechanisms and obsessional reactions.

This is an excellent manual for the professional library.

Clinical Orthopaedics: Volume 9: The Pathologic Physiology of Metabolic Bone Disorders. *Edited by Anthony F. DePalma, M.D., Editor in Chief, with the assistance of the Associate Editors of the Board of Advisory Editors and the Board of Corresponding Editors. Under the Auspices of the Association of Bone and Joint Surgeons. Cloth; price $7.50. Pp. 353; illus. J. B. Lippincott Co., Philadelphia, 1957.*

The first half of this book covers the clinical aspects of metabolism of bone. This will serve as a reference for therapists interested in a

specific patient but, otherwise, is somewhat too technical for general reading. There is one chapter on prosthetics in child amputees with illustrative cases and pertinent comments concerning the problems of fitting and training. This should be of interest to all therapists concerned with upper extremity amputees. The last part of the book contains the section on motor injuries and motor safety. This should be read by anyone driving a car.

The entire book is well organized, well illustrated, with adequate references. The index is satisfactory and the printing is excellent.

For the average therapist this is a specific reference book which may be useful but not one which the average therapist will need in a personal library.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

Our Book Reviewers for June

Louise Arey Esterer, Special Education Consultant, Longview, Washington; formerly, Supervisor of Special Education, Michigan State Department of Public Instruction.

Dorothy I. Glidden, Capt. AMSC, Chief, Physical Therapy, U. S. Army Hospital, Fort Polk, Louisiana.

J. Leonard Goldner, M.D., Profesor of Orthopaedic Surgery, Duke University School of Medicine, Durham, North Carolina.

Susanne Hirt, Director, School of Physical Therapy, Medical College of Virginia, Richmond.

Clare S. Spackman, Associate Professor of Occupational Therapy, Philadelphia School of Occupational Therapy, School of Auxiliary Medical Services, University of Pennsylvania; Director, Curative Workshop.

Jessie F. Waddell, Chief of Orthopedic Nursing and Physical Therapy, Michigan Crippled Children Commission, Lansing.

Index to Current Literature

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REHABILITATION

Cost of Rehabilitation in a Comprehensive Center. Odon F. von Werssowetz, South. M. J., 51: 150-152, February 1958

Personality Integration—A Concept of Rehabilitation of the Disabled. Sidney Z. Brent, Am. J. Phys. M., 37: 7-17, February 1958

Physical Medicine and Rehabilitation in a Chronic Disease Hospital. J. S. Tobis, M. Lowenthal and I. Pelmont, Arch. Phys. M., 39: 82-86, February 1958

Pre-vocational Evaluation in the Workshop. Jerome Menchel, Am. J. Phys. M., 37: 28-34, February 1958

Rehabilitated for Living. Morton Hoberman and Benjamin H. Lipton, Arch. Phys. M., 39: 75-81, February 1958

Social Security for the Disabled. Arthur B. Price, Arch. Phys. M., 39: 92-95, February 1958

Symposium on Geriatrics—Rehabilitation of the Elderly. Edward M. Krusen, South. M. J., 51: 225-228, February 1958

The Care of the Long Term Patient: A Review of the Administration of Patient Programs. Edgar J. Munter and Mark Berke, J. Chronic Dis., 7: 144-177, February 1958

MISCELLANEOUS

Case Study—The Worst Patient on the Floor. Thelma Ingles, Nurs. Outlook, 6: 99-100, February 1958

Chiropractic—Straight or Mixed? (Editorial) New England J. M., 258: 300, Feb. 6, 1958

How to Plan a Medical Motion Picture Film. J. P. Hackel, New York State J. M., 58: 735-737, March 1, 1958

Information for Contributors

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be placed each on a separate sheet. When citing another author's work, a superscript numeral must appear in the body of the manuscript. The *references* must be accurate and numbered in the order in which they appear in the text. Include the name of each author, title of the article, name of periodical, volume number, inclusive pages, and date.

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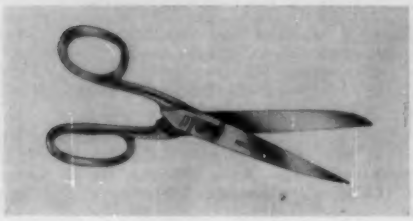

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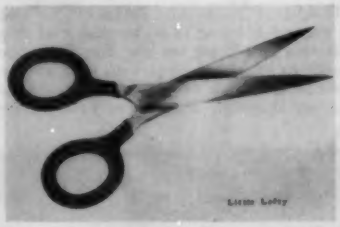

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(continued on next page)

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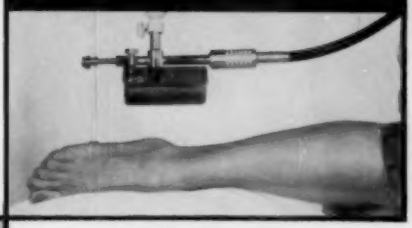

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CAMP HEAD HALTER

Available in complete set or individual units

The improved Camp Head Halter is lined with foam rubber vulcanized to strong tackle twill for patient comfort and better fit. Camp's side buckle opening feature permits presetting by doctor or patients for easy donning and removing in the hospital or at home and makes it possible to apply the halter without movement of the patient's head. The notched spreader bar affords use in varying widths.

CAMP TRADE MARK

S. H. CAMP and COMPANY

Jackson, Michigan